

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XVIII.-No. 2.

NEW YORK, JANUARY 11, 1868

Improved Steam Engine for Rolling Mills.

The engraving is a fine perspective view of a new steam engine lately constructed at the South Brooklyn Steam Engine and Boiler Works, for the Trenton Iron Companypractical engineers, a critical examination of the engine on so successfully employed in other departments of business. the occasion of its completion, a few weeks ago, and the

opinion then express ananimous that it specimen of workman-ship. It is fitted with the Babcock & Wilcox cut-off valve, of which we gave a detailed description in No. 17, Vol. XVII., first page, to which we refer our readers. The valves and connections are of course somewhat modi fied to suit the circumstances of the case. Those who saw the engine there described at the late fair of the American Institute will readily understand the operation of this.

An immense cast iron open pedestal sustains the cylinder, steam chest, and connections, the connecting rod and crank working inside the column near the bottom. The fly-wheel and spur-wheel are secured to the shaft by three massive feathers forged on the shaft, the intervals between which and lugs cast in the interior of the hubs are filled with hard wood wedges, intended to receive and diminish the jar and concussion to which an engine employed for driving rolls must be subjected. The fly-wheel is unusually heavy, weighing 55,000 lbs., and is 22 feet in diameter. Especial attention has been given to securing durability in the working parts, they being made as hard as will allow tool finish. The forgings are made of

Messrs. Cooper, Hewitt & Co.'s best gun-barrel metal, and the ifestly beneficient to the agriculture of the present era, as in | year by year, of the center of wheat production, thus adding brasses of the best government standard composition. The the improvement of agricultural implements. In 1847, the crank-pin is lubricated by an automatic attachment acting through its center, and the slides by traveling roller dipping in drip-cup. For the benefit of engineers we give the principal dimensions and weights:

Cylinder, 46 inches diameter and 40 inches stroke, with steam jacket and double lower head, weighs, with steam chest, 10,910 lbs.; column connecting cylinder to bed-plate, 23,513 lbs.; cast iron bed-plate with inboard pillow blocks, 18,923 lbs.; eccentric, 32 inches diameter and 5 inches face; piston rod, 6 inches diameter with cross-head forged on; wrought iron crank, 2,130 lbs.; wrought iron shaft, 15 inches eter, 16 feet 6 inches long, 10,807 lbs.; inboard journal brasses, 15 inches diameter and 27 inches long; outboard brasses, 15 inches diameter and 30 inches long. The total weight of the machine is 151,518 lbs.

The engine is calculated to make 75 revolutions per minute at a steam pressure of 80 lbs., and is, although so compact, of 1,200 estimated horse power; which must be acknowla remarkably good result when the dimension the machine are taken into consideration.

From the above, and the view of the engine given in the engraving, a tolerably correct idea may be formed of its massiveness, compactness and solidity.

REPORT OF THE ACTING COMMISSIONER OF AGRICUL-

The following selections from this public document will be found to be of general interest:

did appearance. We made, in company with a number of ture money, business energy and active enterprise, which are

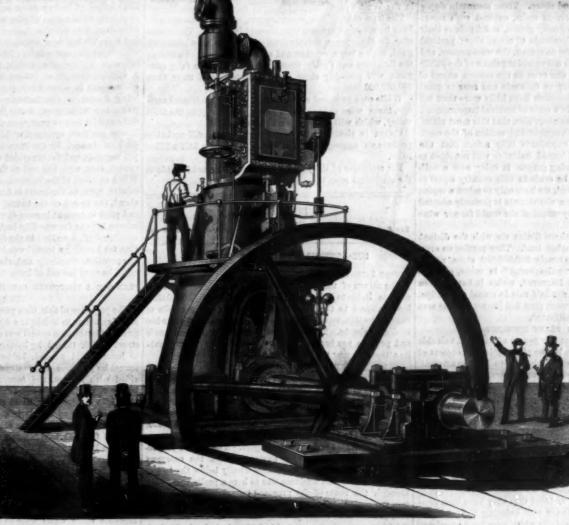
In nothing is this intellectual activity shown to be so man- yield scarcely three bushels. None will doubt that it is more

our people in the advancement of agricultural science—of and even utter a note of warning, in view of the improvi-the quickened mental activities of farmers, as shown by the widening demand for agricultural books, newspapes, and of their wealth of fertility, exposing them to the constant the reports of this department—of the disposition to experi- action of the elements, and subjecting them to an annual action of the elements, and subjecting them to an annual Cooper, Hewitt & Co.—and now being erected in their rolling ment, test alleged improvements, and adopt labor saving expedients—of the growing inclination to employ in agricultured to the soil. The department estimate of the average drain of the same constituents, none of which are ever reproduction of wheat in Ohio, last year, was about four bushels per acre; the State statistics, so far as returned, made the

> owing to bad culture and went of drainage age twenty bushels Every new Western State is remarkable for sounding reports of great crops of wheat, and the same States, in a very few years, are equally remarkable for reduction in vield of wheat increase of insects, and prevalence of disease.

The freshest areas in this culture, east of California, will scarce ly yield an average of twelve bushels per acre the present year. A systematic rotation. some attention to fer tilization, greater care in the selection of seeds, better tillage, and more thorough culture, will alone prevent deterioration in products and real values of farm property.

This stigma upon American agriculture may be attributed in part to the cheapness of Western lands, the original price of which bears so insignificant proportion to their intrinsic value, that the owner erroneously deems it cheaper to remove to new lands than to sustain and increase the productive capacity of his present farm. One result of this fatal error, is the removal westward,



THE BABCOCK & WILCOX UPRIGHT STRAM ENGINE.

number of agricultural patents granted was but 43; in 1863, it had increased to 300; in 1864, to 563; in 1865, to 642; while in 1866, the wonderful increase to 1,778 was made; and during ten months of the present year, the patent-office has issued no less than 1,777. Thus the number of agricultural inventions perfected yearly is now more than forty-fold greater than twenty years ago. Already has this nation surpassed all others in the excellence and variety of its agricultural machinery. Partially represented as was our agriculture in the recent world's exposition of industry, at Paris, and almost ignored officially in the national recognition of that great exhibition, our honors plucked from the field of European competition were almost exclusively industrial, and largely agricultural. So successful have been our farming implements in repeated contests on European soil, that their rapid introduction into foreign markets is only impeded by the greatly increasing demand at home. These improvements are rapidly revolutionizing the agriculture of the West, and reducing to the lowest minimum ever attained, the proportion of manual labor employed in its operations. As an instance, the reaper, first doing the labor of a half dozen, then a half a score of men, is supplemented with a self-raker, which does the work of others still; and now further to facilitate and economize the harvest work, the same machine is furnished with apparatus for instantaneous binding of the sheaves. And the further this labor-saving progresses, the higher the wages of harvest workers, the broader become the harvest fields, the greater are the profits of the farmer, and the more extensivo become the garners of the world.

transportation and other charges to its ultimate cost, threatening to make difficult the future supply of our population, and to render export impossible.

The railroad interest has secured among other favors and franchises of the government, grants of public land, amounting to 184,000,000 acres, in aid of lines extending in all ditions, to the borders of civilization, under the plea of furnishing facilities for travel and the transportation of the fruits of agriculture and the products of mines; and the results have been seen in extended settlement, and expanding cultivation: yet growing strenger, disregarding the general welfare, these monopolies have combined in their tariff of rates to discriminate unfairly against farm products, and to require much the larger portion of the value of the crops for their transportation to market. So onerous is this burden, that the cost of transportation of wheat from Chicago, and other Western centers, to the Atlantic cities, is greater than from San Francisco, via Cape Horn, to the same points. It is hoped that the attention of rural voters to this subject may ultimately correct this evil which preves so seri to their industry; but it can only be accomplished by untiring vigilance over State legislation, and by securing the enactment of laws that shall restrain these corporations from the absorption of the entire products of the farm, instead of allowing them to control the legislation of the country against the best interests of the people, and especially to the detriment of the consumer, who is made to pay tribute to this combination which breaks down a fair competition incidental to all other classes and associations in the business of life

PROGRESS IN AGRICULTURE.

It is gratifying to note the evidences that are apparent

While adverting to these evidences of progress in Ameril

even to the superficial observer of the increasing interest of

can agriculture, it is proper to drop a word of dissatisfaction,

and In this connection I desire to express the hope that Congress may devise and perfect some plan for facilitating the

can agriculture, it is proper to drop a word of dissatisfaction,

can agriculture and the superficial observer of the increasing interest of

ing of a double track freight railway, open to all, forwarding on equal terms, and supported by an equitable system of tolls. THE SOUTHERN STATES.

These States possess decided natural advantages over the Northern and Western sections in their ability to produce every article which may be grown in the higher latitudes with the almost exclusive advantage of producing cotton, hemp, rice, sugar, and other products of the lower temperate With longer shore-lines than any other section of the continent, facilities are furnished for coastwise and inland navigation to the whole tide-water area, which is endowed with a climate peculiarly adapted to market gardening, with forests abounding in the most valuable timber, and waters teeming with edible fishes and crustace. Florida is destined to be a winter garden, yielding market supplies to Northern cities without a risk of competition, and oranges, figs, and olives, and other fruits of semi-tropical climes. Between tidewater and the lower slopes of the mountains is a region pro ducing wheat of a better quality than that of any section north of it, the entire range of farm products in great pro-fusion, and such fruits as apples, cherries, and grapes, with certainty and success. The mountain region, almost unappropriated and unknown, at an elevation varying from 1,500 to 6,000 feet, is the great grazing section of the North Americs, sufficient to furnish abundant pasturage through the year to millions of cattle and sheep. These mountain slopes are generally free from surface rocks, covered with forest growths interspersed with grassy glades, and fertile to their summits. In bedies of thousands of acres, these pastoral areas await the advent of the dairyman, the wool-grower, and and the herdsman, at prices not exceeding those of the public lands of the distant West; and even on the eastern aspect of the Blue Ridge, in proximity to railroads and near to great markets, whole counties together have little more than ten per cent of their territory in a state of nominal improvement.

There are grounds for assuming, also, that this must ultimately become the great wine-producing section of the coun try; for observation and experience fully attest that the higher, colder, and more humid latitudes will not ripen to perfection the wine-producing grape. It being now a wellnotiled fact that wine can be made in this country equal to the best that can be imported, we have only to select a region of our great country where the climate is perfectly adapted to grape culture to be independent of the world for our wine

It appears that the Southern States vie with the distant West in extent of unoccupied land. They possess an area not in farms, amounting to nearly 300,000,000 acres, nearly two-thirds as much more "unimproved" in farms, and less than 75,000,000 nominally improved, which is but thirteen per cent of the whole, and not half this in actual cultivation. It is safe to say that little more than five per cent of the area of the South is annually cultivated.

THE SEED AND PLANT DISTRIBUTION.

The distribution amongst the people of new and valuable seeds and plants appears to be one of the principal objects of Congress in the annual appropriations to the department. This has become a most delicate and difficult duty, for what is new in one country may not be valuable or useful in another; the most valuable of seeds or plants may be, in some sections of our own country, the most common varieties, ye unknown in other sections; and those which would be of the utmost value in one latitude might be worthless in another. Experience has fully shown that a change of seeds and plants from one section to another, has greatly improved the yield and quality. These results can only be attained by repeated and constant tests of the adaptation of the several varieties to soil and climate. New varieties are obtained whenever satisfactory evidence has been adduced that they have been properly tested; and the people are now enjoying the benefits of many new and valuable products which have been introduced into the country through the agency of this department. The crops of sorghum alone would more than compensate for all the money expended by the department for seed.

The total distribution of seeds for the year amounted to 1,426,637 papers. Of this number 352,000 were distributed through senators and members of the Thirty-ninth and Fortieth Congresses; 88,482 through agricultural and horticulteral organizations; 164,953 to corps of statistical correspondents, in acknowledgment of valuable gratuitous services 299,975 to individuals upon letters of members of Congress, or upon personal application, or in answer to letters from individuals; and 521,227 to the Southern States, under the special appropriation for that purpose

The distribution of plants from the experimental and prop agating gardens, from January 1 to May 6, 1867, amounted to 42,123, principally through senators and members of Congress, reaching every State and Territory in the country. The articles have consisted mainly of the smaller varieties of fruits, of which the grape has been in large proportion. The introduction of the test varieties of this valuable fruit, their adaptation to various climates, and for special purposes, has been prominently kept in view. The main purpose of the garden, that of testing the respective merits of new varieties, is still kept strictly in view, and all new varieties are procured as early as practicable, and the knowledge gained concerning them embodied in the department reports.

STATISTICS

The work of the division of statistics has been various and laborious. A mass of ascertained facts, of foreign and domes tic agriculture, with approximate estimates of current productions of the staples of the farm, will be found in the report of the statistician, condensed and systematized, with careful analyses and explanatory illustrations and comments. For several years the estimates of production included only

Western products from the lakes to the ocean, or for the build- the Northern States, until people had become familiarized with aggregates representing the production of only a por-tion of the country. The incorporation of the Southern States in a grand summary of agricultural results, was doubly difficult, in view of the cessation of all regular agricultural order during the war, and its shattered and uncertain status on the return of peace. The wonderful agricultural progress of the distant Pacific States has complicated the difficulties of accurate compilation of the statistics of production. Yet, with the aid of a large corps of zealous and intelligent reporters, in all sections of the country, valuable results have en achieved in this branch of the department.

In comparison with 1860 the table of numbers and prices of farm stock exhibit a decrease of six per cent in horses, with a slight increase over the exhibit of the previous year. The heaviest less is shown in the South; the most rapid recuperation in the West. Prices of horses have retrograded less than values of other stock during the year.

Cows appear to be increasing more rapidly than other horned cattle, as a result, in part, of the success of the asso

ciated dairy system. Sheep, it is claimed, have nearly doubled in numbers since 1860, increasing from twenty-three to more than forty millions, and their wool from sixty to one hundred and fifteen millions of pounds.

There has been an increase in swine since 1860, principally in the West.

The farm crops of the present season, with some exceptions have been more abundant that those of last year. The wheat crop, for three years comparatively small, has been generally good, with a large acreage and a moderate yield. Including the Southern and Pacific States, the returns, when fully com plete, will probably show a total aggregate of more than 200,000,000 bushels.

While corn promised a large yield, with an increased acreage, there were serious local losses, principally in the Ohio valley, which will tend to reduce the estimates.

Cotton is yielding better than last year, and will probably produce an aggregate of more than two and a half million

For estimates of the principal products reference is made to the statistical report.

Correspondence.

The Eilliors are not responsible for the opinions expressed by their cor-

SUB-AQUEOUS AND OTHER TUNNELS.

EDITOR SCIENTIFIC AMERICAN:

The return of the inclement season when boats and vehies are liable to be impeded by snow and ice, will probably lend interest to the consideration of additional methods of communication, especially between large cities and their immediate suburbs. The subjoined history of various tunnels and projects has been compiled with a view to call the public attention anew to the subject.

THE THAMES ARCHWAY COMPANY.

Among the earliest of the projects for sub-aqueous tunnels were those introduced under the auspices of the Thames Archway Company, of London, in the beginning of the present century. This corporation having obtained authority from Parliament, raised subscriptions to the amount of £200,000, and prepared in 1809 to construct a tunnel under the Thame river for carriages and foot passengers. The charter prohibited them from obstructing navigation, and the company started with the idea of operating wholly below the bed of the river. The first business was to bore a preliminary drift through the route of the proposed tunnel, in order to ascertain the exact nature of the soil and the difficulties, if any, that the Builders would probably encounter. Richard Treve thick was the engineer of this drift. A shaft of nine-inch brickwork was first sunk on the south bank of the Thames to a depth of 76 feet below high water mark, and the drift was then extended horizontally, in a northerly direction, toward the opposite bank of the river. The drift was a temporary tunnel 5 feet high, 3 feet wide at the bottom and 2 feet 6 inches at the top. It was lined with a frame of 3-inch planks.

The drift was successfully prosecuted for a distance of 923 feet, which was further than the actual width of the river, the real width being 850 feet at high water and 649 feet at low water. The drift was purposely run out in various direc tions, diverging from the true line in order to test the soil, At the extreme end of the drift, before it had quite reached the opposite bank of the river, the engineer encountered a quicksand, and finally gave it as his opinion that the construction of the proposed excavated tunnel on that line was impracticable. He, however, suggested other plans for laying a tunnel which he considered entirely practicable. Other en gineers were, however, of opinion that the original plan was practicable, notwithstanding the quicksand. The Diconcluded that in so nove taking it was desirable, before adopting any plan, to endeavor to avail themselves of the best which the engineering talent of the country could suggest. They accordingly caused advertisements to be published in the newspapers, offering a premium of £200 for the best plan of construction, and a further sum of £300 when such plan had been successfully completed.

In response to this advertisement no less than fifty-four plans were submitted and were examined by two able scientific men, entirely disinterested, Dr. Hutton and Mr. William Jessop. Many of the plans had great merit, but all were, for various reasons, rejected except six; and of these the examiners finally selected as best of all, the joint project of Mr. Charles Wyatt and Mr. Hawkins.

We propose now to give a brief outline showing the nature of each of these six projects, which at that time, 1809, attracted great attention. The plans were presented anonynously to the company, and we are therefore unable to present the names of the projectors, except in some instance

PLAN FOR A BRICK TUNNEL

The tunnel to be of brick, a complete circle, 13 feet diameter, three bricks thick, having a carriage way 7 feet 9 inches between the curbs, a foot way on one side, lamps the other. As this tunnel would be buoyant, the projector proposed to cover and ram it six feet below the bed of the river, with clay. In laying down this tunnel the projector proposed to form coffer dams of fifty feet length at a time, in the direction or the tunnel, the walls of the dam being formed by driving down piles; the spaces between the piles to be filled with prisms of wood and the whole carefully calked; the bed of the river to be then excavated and a section of the tunnel built. While this was going on another section of dam to be put down. The piles to be sawed off even with the river bed on completion of each section.

PLAN FOR A CAST-IRON TUNNEL.

This plan was by R. Trevethick, the distinguished engineer, to whom is due the credit of the high pressure steam engine. This tunnel was to be 12 feet in diameter, composed of cast iron slabs each 6 feet long, joints to be calked. The method of laying down was to excavate the bed of the river from within a set of piles driven down within a movable coffer dam. The movable dam or caisson to be 50 feet long, 18 feet wide, 40 feet deep, made of 12-inch square logs, fastened with trunnions and calked. The caisson to be provided with two water-tight compartments, to float the whole machine. A sufficient weight of ballast to be used to sink the caisson when water is admitted to the compartments. The caisson being floated to the desired position, plugs in the compartments are withdrawn, water is admitted, and the caisson sinks and its bottom rests upon the bed of the river. Guiding frames are then arranged within the classon, pil's driven, a ditch or channel for the tunnel excavated, the tunnel plates put together, and the excavated earth rammed down upon the tunnel even with the bed of the river, as fast as completed. When as n uch of the tunnel is complete as the length of the caisson permits, the latter is floated and moved one length ahead, the mouth of the tunnel being first stopped with clay and piles to prevent ingress of water. The water within the caisson is to be drawn off by boring an opening down into the existing drift, described in the first part of our subject. This plan for building a tunnel was highly commended for its ease of execution, simplicity and cheapness. Brick, if preferred, could be used instead of iron.

PLAN FOR A TEMPORARY CAST-IRON AND PERMANENT BRICK TUNNEL.

The projector of this plan proposed first to lay down a tunnel of cast iron, to be laid in a ditch dredged in the bed of the river. After the iron tunnel was completed he proposed to construct a brick tunnel by boring, the line to be deep enough to insure solid ground, below quicksands, etc. The iron tunnel he proposed to construct of separate cost plates, provided with flanges, and secured together with bolts. The laying of the tube was to be accomplished by means of capacious iron diving bells fitted with the means for convenient access of men and materials, air pipes, etc., operated by steam engines. It will be seen that the American patents granted for cast iron tunnels screwed together were anticipated in England more than fifty years ago.

GROOVED STONE TUNNEL.

This plan provided for the laying of a stone tunnel 30 feet in diameter, the edges of the stones to be tongued and grooved, and joined with water-proof cement. The stones to be carefully prepared before being brought to the river. Movable coffer dams were to be employed, within which a ditch was to be excavated and the tunnel constructed. The bottom edges of the dams were to be provided with a flexible curtain of tarpaulin, to prevent bottom leakage. The tunnel was to be two feet below the bed of the river, covered with clay, well rammed. This plan is somewhat similar to Trevethick's, before described.

A TUNNEL OF BRICK OR OTHER MATERIAL.

This plan provides for a tunnel to be laid like the foregoing a ditch to be opened by means of a coffer dam. The tube to be covered with earth after construction and rammed so that the bed of the river directly over the tunnel will not be elevated. The chief peculiarity was in the construction of the dam, which was to be 90 feet in diameter, made up of stave logs a foot square, the bottom ends of the logs to rest on the bed of the river. Stability was to be given to the staves by means of internal hoops. After one section of the tunnel had been completed the dam was to be taken apart, moved along, and erected for the building of a new section.

PLAN FOR A WOODEN TUNNEL.

the most easily executed, was another of Trevethick's designs, for a wooded tunnel, 16 feet in diameter. The drift previously constructed by him was to be used for drainage of the wooden tunnel.

"The cut across the Thames is to be made beneath the water by a steam ballast-raising engine 24 feet deep below the bottom of the river, and wide enough to receive the wooden tunnel, and with its sides sloped in an angle of about 45°. This cut is to be nearly horizontal at the middle of the river, but declining about 6 inches toward the south, for delivering the water from the road down into the drift; the remaining parts at each side are to be inclined one foot in tourteen, which is about the degree of inclination of the bottom of Holborn-hill.

This slope will ascend to the surface at the south side about 100 feet south of the shaft, and at the north side about 150 feet north of Queen street, in the field adjoining to the Commercial Road; making the total length of the tunnel

All the earth that is above low water mark may be re moved with spades.

The wooden tunnel, for which this cut is to be prepared, is to be made of elm, in lengths of from 180 to 200 feet of sixinch plank, placed two in thickness, or in two layers, laid so that the joints shall be covered by the planks in the other layer, fastened together with trennels, hooped outside with iron, calked, pitched, and made water tight like a ship. The hooping to be put on in a spiral form, with the spirals two feet asunder.

The ends of each length of the tunnel are to be made to fit into each other, or to be put together with cast-iron ferrules, of 6 feet long, similar to the joints of a flute.

Each of these wooden cylinders will weigh about 200 tuns, and may be moved in water nearly as easily as a loaded barge. As many of these cylinders are to be prepared as will extend from side to side of the river above low water mark, when joined end to end, which will be about 1,340 feet. From each end of the wooden tunnel to the entrances, the passage is to be left at intervals open to the surface, to admit light, and is to have both its sides and bottom constructed of brick work 18 inches thick. This part will extend about 670 feet (at each side), and will complete the tunnel from the surface at one side of the river to that at the other. Staircases for descending into the tunnel are to be formed at each side; the interval of the tunnel between these. which will be about 876 feet, must be lighted by lamps always; the remaining 464 feet (at each side) will receive daylight through apertures made like wells from the surface, at intervals of about 30 feet from each other.

After the cut is excavated, piles are to be driven at its eastern side, about 60 or 70 feet asunder, to guide the wooden tunnel into its place. Then the wooden cylinders (which are intended to be made near the Surrey Docks) being ready, are to be rolled into the docks from the banks, and to be towed to the cut, a little before low water, when there is little or no tide, being previously loaded with rubbish sufficient to sink them, but kept buoyant by empty casks attached to them. Here they are to be placed across the river, resting against the piles above mentioned, their ends to be joined into each other and to be drawn tight together by a rope and chain put through them from end to end.

At extreme low water the lashings or cords are to be slipped from the casks, and the cylinders are to be let to sink altogether to the bottom of the cut, which is to be then filled up with strong clay, well rammed down, even with the bottom of the river. A hole is then to be bored into the bottom of the tunnel from the roof the drift (which is to be previously dug beneath the cut), to let the water down from the tunnel to the well of the steam engines

When the tunnel is drained it will have a great tendency to float, but having an average of eight feet of clay above its top, with the weight of the road inside, its buoyancy will be overbalanced. If, after a number of years, the wooden cylinders decay, they may be easily replaced by putting cast-iron cylinders, one inch and a quarter thick inside; and if any difficulty is found in letting down the whole of the cylinders at one time, they may be put down separately, and afterward be joined together beneath the water.

Betheate of cost for 1.346 fest and the lating thereof under the street one of the first light well at both sides, 600 fest long, 80 fest wide at top, and 36 deep, about 45,000 thus, as 25...,54,36 (utting from said light wells to each entrance, 64f feet long, about 30 feet wide, and 12 deep, estimated at 6.300 thus, at 25... 64. Wooden thunel, 1,256 feet long, 16 feet diameter from out to out, 1 foot thick, estimated 39,470 feet, of rough eim, or 2,332 loads, at 27 per load.

ors, boats, etc... g the engine at work one year, attendance, agency, etc. at £50 per week....ddental charges, 10 per cent on the whole amount.....

To be continued.

011 Well Pumping.

MESSRS. EDITORS :- In your issue of December 14th, page 370, appears a communication, signed M. R. M. Robinson, Franklin, Pa., concerning oil well pumping, and his experiments and experience in that line, and which he concludes by asking for information, etc.

Allow me, through the same channel, to say that Mr. Robinson's assumptions of what constitutes a vacuum and its effects in his or any case are simply wrong and absurd, and I am surprised that your responsible editor should publish it, in its present form, without remarks or corrections, and for the reason that they are contrary to natural laws.

Mr. Robinson states, that he has, in his oil well, placed his seed bag one hundred and thirty-one feet above the bottom ng, where his pump chamber is located, and as sumes that the well fills up to the seed bag with water and oil, when not pumped; and that the well is air tight below the seed bag. He also asserts, that when he has pumped the water until its surface in the well has fallen, say thirty-five feet below this seed bag, that a perfect vacuum is formed; and consequently he cannot lower the water by pumping, but must have still remaining in the well, outside the tubing, the balance of this column of water and oil standing pinety-six feet above the bottom of the tubing, and that he cure the oil which remains above the water in this column until he has supplied this vacuum of thirty-five feet with air or water which he admits through the half inch pipe, which the parallelogram of motion, gives the curves on the tablet. pipe extends from the top of the well down, and just through

below the bag. Now, this statement of facts is simply impossible, and for the same reason as first stated, and as will appear.

The offices of a pump are two-fold: the first is to lift the weight of the atmosphere from or off the column of water below it, and which is about fifteen pounds per square inch; and, secondly, to lift the superincumbent weight of water above the pump.

In thus lifting the sucker valve, a vacuum is formed be neath it by this removal of the atmospheric pressure; and if the surrounding water is open to the atmosphere with its pressure upon it, the water will thereby be forced into and up the pump, and will follow this sucker upwards until the weight of this column of water within the pump shall have attained the limit of fifteen pounds to the inch, when the column will cease to rise further, and it will remain just balancing with the atmosphere without. The sucker may be raised as much higher as one pleases, but the water will not follow it. Should the water or oil be heavier or lighter than fresh water, the hight will be more or less in the same pro portion-fresh water raising about thirty-three feet at the ocean level.

Again, if the outside pressure of the atmosphere be impeded or removed, then the water within the pump will be raised less or not at all, as the case may be. Now, if by pumping his well, he can produce a vacuum, it must be the same within the pump as in the well outside the tubing; and as the water will find its own level with the same surroundings, it follows that, even with a perfect vacuum, the water or oil will flow into the pump, and fill it, so long as the surface of the water outside the tube is two feet above the bottom of tubing; and if it is but one foot above the bottom, it will stand the same hight within the pump, and the sucker in descending into the half filled pump will produce a thumping concussion, and continue to thump so long as the pump cham ber is partially filled at each stroke.

If, however, the small pipe be opened, and a supply of air admitted to the well, and the pressure of the atmosphere therein restored, then the water and oil will be forced into the pump to its full capacity at each stroke, so long as there is a supply of either within the well to reach the lower end of the tubing.

If the letting down of water by the small pipe increas the flow of oil, it is from some other cause than that named by Mr. Robinson, and probably may be accounted for by the washing and floating down the oil from the sides of the well and from the crevices and small reservoirs which have been left full by the receding column in the last pumping; on no other hypothesis can the advantages of his "Fresh Water Washing Down" be accounted for, and on no other gro can it be more advantageous than the admission of air, while the water makes just so much more work for the pump to lift it out again. The query which concludes his article is too inconsistent to need comment, when his statement in the ame is so definite and plain.

I trust this will be acceptable, and received in the same spirit with which it is written, and that is to correct error,

and to answer the communication referred to. Albany, Dec. 10, 1867. HORACE L. EMERY.

The Warming of Cars.

MESSES. EDITORS :- When reading the account of the terrible accident of the 18th inst., on the Lake Shore Line of railroad at Angola, it appeared to me to be the imperative duty of every newspaper of respectability to raise a voice for heating cars by hot water instead of stoves. Statistics appall one when we realize the horrors arising from fire in such cases as the accident spoken of. N. F. P.

APPLICATIONS OF ELECTRICITY AS SEEN AT THE PARIS EXPOSITION

The following notices are from the correspondent of the Nation, and form an interesting group of paragraphs concerning electricity, although few of the inventions are new in this country. Most of them have been long in use here :-

THE METEOROGRAPH,—This is an apparatus destined to register meteorological phenomena, by means of graphic curve traced upon paper, the movement of which is registered by clock-work. It was invented by Father Secchi, director of the Observatory at Rome, Italy, and occupied a conspicuous place in one of the principal streets of the Palace. It was constantly at work, and was deemed worthy of a grand prize by the jury of awards. There were two prominent faces to the appa ratus; one of them was surmounted by a clock, and provided with a paper tablet on which were registered automatically the indication of the barometer, the wet and dry thermome ter, and the hour of rain. This roll or tablet of paper would finish its course in two days and a half, and present well developed curves, the study of which would give all of the details of the phenomena, especially the sudden changes during storms. The second face presented a tablet on which was played by hand. registered the force and direction of the wind, as well as the Magnero-Electro Machines.—There were several machines its course in ten days, and its principal advantage is to present a résumé of the variations of the elements in the way to permit of an easy comparison. The manner in which the various instruments are connected with a galvanic battery is too of diagrams, but a general description may enable the reader properly counterpoised piston floating on the mercury in the The psychrometer consists of two thermometers, with dry

the bottom have platinum wires fused into the bulbs to connect with the battery. Two platinum wires, supported on a frame which moves vertically, enter the capillary tubes of the thermometer, and can be plunged at any moment far enough to touch the mercury and thus establish the circuit with the battery. The clock sets in motion every quarter of an hour a little chariot, on which is a miniature Morse telegraph, and which marches back and forth recording in the neatest man ner the variations between the wet and dry bulbs, and the moisture of the air. The hour of the rain is marked by the movement of a magnet attached to a wheel provided with buckets and placed on the top of the house. The quantity of the rain is measured by the indications of a float in a suitable reservoir in the basement, and is also automatic in its mo tions. The direction of the wind is measured by four tele graphs—the force of the wind by peculiar hemispherical wheels or capstans. The battery employed was a modifies tion of Daniell's which only required the addition of a little water and sulphate of copper every month. A similar apparatus had been in operation for nearly seven years at the Ob servatory in Rome, and bound volumes of the observations taken during all that time were exhibited in Paris. The cost of the apparatus was \$10,000, but it was unnecessarily luxurious in its appointments, and similar ones could be nanufactured on a large scale, in a similar style, for one fifth of that amount. It was a matter of regret among Americans in Paris that the automatic registering and printing barometer of Mr. G. W. Hough, which is in operation in the Merchants' Exchange in New York, was not sent to the exhibition, for comparison and criticism. It is now universally admitted that only by automatic instruments can we ever hope to solve the question of storms and other meteorological mena, and therefore all the inventions of this character must be studied and compared before we can hope to see any particular form universally adopted. Father Secchi's ingenious apparatus was pronounced by competent judges to do its work thoroughly and well, and we should be glad to see it introduced into this country.

ALARM THERMOMETER.-In the agricultural department ras a self-regulating and alarm thermometer, con upon a plan similar to the one adopted by Secchi. A platinum wire is fused into the bulb, and a second wire inserted at the degree to which it was proposed to raise the temperature in a hot house or other building, and both wires were connected with a battery which drove a magneto-electric machine so situated that it could be seen at all times by the director of the establishment. In this way control was kept of the temperature, and any neglect on the part of servants at once noted.

ELECTRIC LIGHT FOR LIGHTHOUSE ILLUMINATION.—The English had a lighthouse of the natural size, the illumina tion in which was obtained from electro-magnets driven by a two-horse power engine. This light was visible at night from nearly all parts of Paris, and was of dazzling brilliancy. The value of this application for lighthouse purposes consists in the intensity of the light. The light is condensed into the smallest possible space, and, while it is not diffused enough for photographic purposes, excepting near by, its intensity exactly adapts it to be seen at great distances. An oil flame would require to be two thousand times larger to produce the same amount of light. The cost beyond the wear and tear was stated to be the fuel required to raise steam for the small engine and the carbon points used in the

An Electric Piano.—A piano driven by electricity was cer tainly a novelty. The instrument was in the section of machinery, and looked exactly like an ordinary upright plano. It was provided with a key-board, and could be played upon in the ordinary way, or attached to a battery and made to work by electricity. It was the invention of a Swiss, familiar with the construction of music boxes, and was suggestive in its form of that class of instruments. There was a long metallic barrel driven by clock work, over which revolved a piece of thick pasteboard in which the musical notes were cut. Resting upon the pasteboard were teeth or copper pointers just like those in a music box, each one of which corresponded with the notes of the piano. The pointers were ed down upon the barrel by springs, and were connected at the other end with a galvanic battery. As long as the pasteboard intervened between the end of these pointers and the revolving barrel, the current was broken and no notes are struck; but as often as the pointer came over a hole cut in the paper, it was thus brought in contact with the metal of the barrel, and the connection in the circuit was established and a note struck on the piano, By bringing these holes opposite the proper pointers, and at distances to correspond to the time of the piece, a complete tune could be played. The papers with the notes cut out looked like a pattern for weaving. Several pieces of music were performed by electricity, and the time and expression were so well imitated that any one would have supposed that the instrument was being

indications of the metallic thermometer. This roll finishes of this character, for which it was claimed that they could replace the ordinary galvanic battery in most operations, as, for example, telegraphing, electro-plating, and electric-light and it was asserted that they could be used as a motive pow er. For some unexplained reason, none of these machines complicated to admit of a detailed description without the aid appear to be successful. They looked well as specimens of workmanship; they were ingeniously contrived; they were to form a clear conception of the ingenious invention. A theoretically correct, but in practice they do not secure the confidence of the public. The electro-magnetic company of barometer, with pencils attached, and applied according to Birmingham claimed for their motor that it could replace steam, especially where the force required was small, that the cost was the same as that of steam power, without danthe seed bagsand communicates with the well at this point and wet bulb. The thermometers are open at the top, and at ger of explosions. The price of a one-horse power was two

hundred and fifty dollars. Some of the magneto-electric ma chines were so covered up that it was impossible to study their interior construction. In all of them the principle of the revolution of helices around magnets appear to obtain.

ELECTRIC ATTACHMENT TO LOOMS.—In case a thread broke in weaving, the fact was indicated by the violent ringing of a bell, and the stoppage of the machinery, all by autor motion, and through the aid of a battery. The same attachment could have been applied to any other machine as well as

ENGRAVING BY ELECTRICITY.—There were inventions of this character for copying in fac-simile any pattern whatso ever. One arm of a pointer moved over a picture, and the other over a lithographic stone or a metal plate, and the cut-ting instrument, by making or breaking the current of electricity, was made to cut or to pass over the plate, and to re peat the shading and depth of any original picture. There were several instruments of this character which apparently did their work well.

ELECTRIC CAR BRAKE.—The engineer is able to put down all of the brakes on a train of cars at the same mor to stop the train very suddenly by simply placing his thumb on the key which makes the conrection with the battery. There were large cars with this attachment, and the whole thing worked well in the model.

ELECTRIC CAR SIGNAL.—In case the cars were broken asunder the fact would be instantly communicated to the engineer by the ringing of a bell.

ELECTRIC CLOCKS were as numerous as the ordinary time -in fact all the clocks on the towers appeared to be driven by electricity, and they consequently kept uniform

CASSELLI'S TELEGRAPH.—This instrument was one of the greatest curiosities in the Exhibition. It represented in autograph the message of the sender. If instead of signing your name to a dispatch you were to make a skillful portrait of yourself with a peculiar kind of ink, an exact copy of the same would be sent. Writing, pictures, patterns, and auto-tographs could be transmitted by this machine with entire accuracy, and if the apparatus was to be attached to the electric engraving machine previously mentioned, the dispatch could be engraved at the distance of a thousand miles from the original copy. A pointer moving over magnetic ink, by making and breaking the circuit, was made to repeat it in fac-simile whatever was put under it. It was all the same whether it was plain writing, a drawing, a pattern, or a picture. The electrograph of Lenoir was a modification of Cas selli's, and appeared to work very well. We saw numerous pictures copied by it.

ELECTRIC SIGNALS of all kinds were exhibited. To an ce that a switch was wrong, that the draw was open, that the down train had not started, that there was de ahead, was all practically arranged. For use in the hous there was no end to contrivances. If the servant did not answer the bell, the bell would keep on ringing all day and all night until it was attended to. If a burglar entered a door or window, his approach would be announced by a lusty ringing of bells. If the water was too low in the boiler, ding dong would go the bell. If the house was growing cold, the nercury would sink in the thermometer and again the bell would ring.

ELECTRIC GAS LIGHTING .- There were contrivances for turning on and off gas by electricity, lighting any number of burners at the same instant of time. By connecting this with the burglar alarm telegraph, the opening of a door or window would set the bells ringing and light all the burners in the house at the same instant.

THE CHRONOGRAPH.—For measuring short intervals of time no instruments have been devised at all equal to those in which electricity is employed. A most important instrument was exhibited by Professor Glassner, of Liège, for measuring the velocity of a cannon ball by recording the interval of its passage from one point to another. The ball in its flight was made to break copper wires placed on its track at measured intervals, and the breakage of the galvanic current was recorded upon a revolving cylinder in a way to indicate the smallest fraction of time. The variation in the velocity of the ball from the commencement in the cannon until it was spent was accurately measured in this way. The same in strument was adapted to the measurement of time in all other observations, the record in all cases being made by elec-

Electric Mirrons.-In order to attract larks in hunting it is customary to have revolving mirrors. But the machinery hitherto employed has rather served to frighten away the birds. Electric mirrors were exhibited which were claimed to be perfect in their way.

ELECTRIC SAFETY LAMP.—The dan mines from the careiess use of Sir Humphry Davy's safety lamp has been frequently demonstrated. It is proposed to obviate this danger by the introduction of a lamp composed of Geissler tubes properly protected by wire and driven by a small Ruhmkorf coil and battery carried in a knapsack on the back of the workman. These tubes have the air pumped out of them and the light comes from a constant stream of electricity passing from one end to the other. If the glass breaks, no fire can be communicated to the outer gases, as the connection with the battery is broken at the same instant and no spark can pass. This kind of a lantern could be used by travellers for reading at night on the railroad, as the whole apparatus can be carried in a carpet bag and can be easily suspended from a hook.

TESTING IRON BY MAGNETISM.

It is well known to engineers that it is a most difficult and often impossible thing to find out the existence of a false weld in a forging, or of a blow hole or honeycomb in an iron or steel casting. The only safe way of doing this is by carefully measuring the clongation of the piece under a given load, as with a false weld all the work is thrown on the diminished area at the defective weld, and the thicker parts are scarcely extended by the force which is perhaps rupturing the bar at the flawed spot. It need scarcely be said that there are many important cases where this process, or the equivalent, but dangerous one, of trying the effects of an impulsive force, could neither be mechanically nor commerci ally practicable. Every one knows that a simple method by which internal flaws and solutions of continuity in construc tive details could be easily detected would be of enormous value to the world. Such a method, says the *Engineer*, has undoubtedly been discovered by Mr. S. M. Saxby, R. N.,who has very judiciously been allowed by the Admiralty, during the course of this year, to experiment with it in the royal dockyards. Though comparatively new, and not yet com pletely worked out, the process will possibly have a yet more extended application than finding out only mechanical flaws in iron, and possibly in cast iron and steel.

The principle upon which this method is founded is so simple that it certainly seems strange that it had previously sped notice. It has been known for nearly a century and a half, that when a bar or any mass of soft iron is placed in the position of the dipping needle, it is at once sensibly magnetic; the lower extremity being a north pole in our latitudes, and the upper extremity a south pole. In the southern hemisphere the poles are of course reversed. The same ction, only weakened, takes place in a bar hanging in a vertical or any other position; only the effect is weaker the m the position of the longitudinal axis, for instance, a long bar departs from that of the magnetic dipping needle

When a small compass needle is slowly passed in front of a bar of very good iron, placed in an east and west direction, the needle will not be disturbed from its proper direction, which is of course at right angles to this, or north and

But this is true only with homogenous bars of best quali-y—to bars without any mechanical solutions of continuity. With internal flaws or interruptions of continuity the bar is no longer regularly magnetic. It has long been known that a good compass needle, or a good permanent magnet, must be homogeneous and without flaws in order to take and retain its maximum amount of magnetism. In a word, any mechanical solution of continuity is accompanied with a polar solution of continuity, and the given bar or mass with flaws —whether permanently magnetised or temporarily so by the inductive action of the earth—is no longer one regular magnet, but severel different magnets, with the different magnetism separated from each other. The delicately-poised magnet of a compass can thus be made to tell the pres-solutions of continuity.

In making tests, practically, the bar is placed in the equatorial magnetic plane, or east and west. On moving the magnetic needle in a line parallel with the axis of the bar, as long as the iron is sound, the position of the needle is easi and west; but on the recurrence of a flaw the latter deviates more and more until entirely reversed, when placed over the imperfect spot.

By the enlightened permission of the Admiralty Board, Mr. Saxby, as stated, has already been allowed to test his method in various ways in the royal dockyards of Sheerness and Chatham, and we will describe some of the practical re sults of these experiments. Amongst these were a number of very remarkable trials conducted in the presence of the master smiths, the foremen of the testing houses, and several of the chief engineers of the royal navy. Mr. Saxby, for nce, was requested to find out the weakest spots in a number of bars, and to tie a string or make a chalk mark on each spot. Immediately afterwards all these bars were put into the testing machine and broken, the prediction in every case being verified.

The smiths of the royal dockyarks seem to have properly tried Mr. Saxby's powers in almost every possible way, and most ingenious devices were sometimes resorted to for the As examples out of many, in the center of a bar of 1 inch square forged iron, was welded a piece of unmagne-tised steel about 5 inches long. The needle detected a fault at about the center of the piece of steel.

A bar welded together out of a piece of bowling and a leee of common iron, had at about its middle a drilled hole, into which a magnetised steel pin had been riveted. The compass magnet soon found out the pin, the difference in quality of the two ends of the bar, and also an unsuspected fault at the end. A bar of round iron was brought to him scrap of galvanised iron, another of common iron, and the third of bowling. The needle detected very unequal qualities, the verdict being that the bar was unfit for being manufactured into any article.

In another case, in which Mr. Saxby's experiments were carried out in the presence of a large number of naval chiefengineers, he put down in writing the results of his magnet ic examinations, in order that they might be subsequently compared with what was known as to the actual quality of each bar. A bar, one and a quarter inch round, and three feet eleven inches long, was pronounced by the compass ne dle as being not of the same iron throughout, and with a south end better than the other. It was then stated by the incredible until the master smith to have been made up of pieces of good and plained.—Engineer.

bad. A rather shorter bar was found to be good iron, but doubtful in condition; it was afterwards explained to be "uncertain," and on testing it in the machine it was stated to be "crystallised." A third piece was found to be of very good iron, but with slight irregularities; the smiths stated it to be scrap iron, and the best to be got in the shop. Two pieces of five-eighth inch manufactured iron were discovered to be not good. Another piece of one and a quarter inch bar was found to be good iron, though made of different qualities—it had been afterwards annealed. With another bar, to Mr. Saxby's written question whether it was not steel, it was ered that the bar in question was a near approach to steel, being a piece of galvanised wire rope welded up. To the remark that another bar was unfit for use he was told that it had been twisted round when at a low heat, and then hammered cold. Some singular proofs of the power of magnetic testing over the ordinary methods of determining quality and condition of iron have been shown. Pieces of iron brought for testing by most able and experienced master smiths, of such quality as would be selected for the most important work, have, on being tested, been marked at spots as defective, and on cutting have accordingly been found at those spots to be partially fibrous, partially crystallised.

The following experiment was made in order to throw light on an important practical question in smiths' work: A round bar 174 inches long was specially worked, and had been brought to be tested without anything of its history being known to Mr. Saxby. He found that in the middle of its length it was seriously faulty, and even unfit for use. He was then told that the bar, though solid, had been "up-set" in the middle of its length, and then hammered down to its original diameter at a temperature below welding heat. This will be held to confirm the opinion of good workmen that "upsetting" should be done at a temperature as near as possible below that of welding.

Mr. Saxby has not yet been successful in testing rolled lates for lamination. In these, again, the neutral, or zero lines, should run at right angles to the dip in a homogeneous plate; but the more complex structure of the plates has made the investigation more difficult. Another difficulty doubtless consists in the fact that the usual shape of a plate does not allow the magnetism to separate itself in such a marked way as in a bar, usually longer by many diameters. The investigation, with a resulting perfect method, can scarcely be said to be completed in this direction. The chief difficulty at present seems to be that the internal structure is

Up to the present but few experiments have been made with steel, and very few with cast iron; those already made have, however, been satisfactory. Any difficulty that might be supposed to attend the presence in wrought iron of what is termed by the Astronomer Royal sub-permanent magnetism is easily overcome. A few taps on the end of a bar of wrought iron, when lying east and west, sufficient to cause vibration, would demagnetize it, and leave it in a fit state to be examined by the needle; and polarity subsequently found would indicate either a steely nature of the bar or inferior

Some brief considerations will now determine the value of Mr. Saxby's invention to engineers, whether for trying new work of all kinds, or even working details in a suspicious state. In estimating the value, in the widest sense of the term, of any wrought iron forging, three qualifications may be considered as governing: (a) Its limits of elasticity, or the amounts it will yield in any given direction without taking permanent sets; (b) its ductility, or the permanent alteration it will take before actual rupture; and (c) its ultimate registance, or the amount of the load it will stand, per original unit of cross sectional area, before actual rupture. These three qualifications, in a complete forging, are evidently-1st, The absence of defective welds, or of large solutions of continuity in the mass; 2d, the absence of smaller flaws or solutions of continuity-either due (a) to the presence of scoria or slag, causing what are termed "greys," or small flaws, either parallel or across the longitudinal axis of a bar, or (b) to cracks (often unsuspected) caused in the working when portions of the forging are too cold; or (c) to actual separations at the facets of the elongated crystals of which iron always consists, and due to loads of whatever kind beyond the elastic limit; 3d, the chemical constitution of the such as its freedom from phosphorus, sulphur, arsenic, silicium, manganese, etc. (apparently everything but carbon in small quantities)-originally governing its mode of crys tallization, and hence more or less its elasticity, ductility, and ultimate resistance to rupture. Now Mr. Saxby's method can detect the presence, and negatively of course the absence, of small or large solutions of continuity. It can detect false welds, smaller flaws caused by bad workmanship or wear, and, we believe, what is commonly termed "crystallization," painted over; it had been "jumped together" in three different pieces and qualities of iron—a bar worked up out of consist in a disruption or parting of the facets of the amorphously arranged crystals of which iron is built up. It can, of course, only detect the results of the chemical constitution of iron, as evidenced in the less perfect cohesion of the crystals when alloyed, in relatively considerable quantities, with foreign bodies. There is little doubt that the magnetic method is a test of the homogeneous character of the iron and of its freedom from fissures and cracks, and so far it undoubtedly forms a test of quality. It will appear scarcely credible that a common pocket compass needle should be able—almost like the divining rod said to be used for finding out springs of water-to discover important defects in large iron bars. A mere statement of the fact does sound almost incredible until the simple means actually employed are ex-

JANUARY 11, 1868.]

Improvement in Sheep Shears The advantages of these shears over those ordinarily used are apparent at a glance. A movable cutter, A, is pivoted to the face of the stationary cutter, B, which is divided into fingers or bars, each one presenting a cutting edge to the action of the movable blade. A slot in the free end of the spring handle, and a screw in the end of the vibrating cutter, with

throw of the blade. The forks of the plate readily enter the matted fleece, thus facilitating the operation of shearing, and the action of the blades insures a drawing cut requiring less power, and producing a cleaner cut than the ordinary shears. The form of the cutter and its throw can be regulated to suit any hand. These shears are also well adapted for shearing horses

Patented by John Ralston, June 4, 1867, who may be addressed for rights, etc., at Slippery Rock, Butler county, Pa.

so powerful, and the flames, enveloped in thick clouds of Y. Territorial rights for sale by him, or by John Schanck, smoke, rose with such violence to the hight of several feet Pittsford, Monroe Co., N. Y. above the opening of the roof, that the nearest spectators were obliged to retire precipitately, and many of them declared that it would be impossible to extinguish the conflagration, and that the shed would be entirely reduced to ashes. When the straw mats were completely consumed, the wood a stop, C, on the opposite side of the plate, B, governs the of the shed was soon in flames in every part. The circum



RALSTON'S PATENT SHEEP SHEARS.

Accounts of experiments showing that violent conflagrations may be extinguished by very small quantities of water, by means of buckets or small hand pumps. By M. Van Marum: The flame of any burning substance must cease, according to well known principles and experiments, as soon

THE SCIENCE OF EXTINGUISHING A FIRE.

as any cause prevents the atmospheric air from touching its surface; thus, when a small quantity of water is thrown upon a body in a state of violent conflagration, this water is at first partly reduced to vapor, which, rising from the surface of the burning substance, repels the atmospheric air, and consequently represses the flame, which, for the same reason, cannot again appear whilst the production of the

vapor continues.

From experiment it appears that the art of extinguishing a violent conflagration with very little water consists in throwing it where the fire is most powerful, so that the production of vapor from the water, by which the flames are smothered, may be as abundant as possible; and in proceeding to throw the water on the nearest inflamed part, as soon as the fire ceases in that where you began, till you have gone over all the burning parts as expeditiously as possible. In thus regularly following the flames with the water, they may be everywhere extinguished before the part where you began has entirely lost, by evaporation, the water with which it was wetted, which is frequently necessary, to prevent the parts from taking fire again; after the flames of a burning body are extinguished, it cannot again take fire, for the above-ment oned reason, till all the water thrown upon it be

evaporated. Being convinced that very little water may suffice for extinguishing ordinary conflagrations, particularly at their commencement, I have endeavored to convince many of my fellow citizens of it by repeated experiments; and I have advised the procuring of small portable engines to be used in cases of necessity. One experiment was the following, a small hand pump being used: I constructed a shed of dry wood, forming a room twenty-four feet long, twenty wide, and fourteen high, having two doors on one side, and two windows on the other. This shed was provided with the wood-work of a roof, but was not covered, and stood about six inches from the ground, that there might be a thorough current of air to increase the fierceness of the fiames when the building should be set on fire. The inside of it was completely covered with pitch, and lined with straw, which was likewise pitched. To this straw lining I fastened wood shavings, and cotton dipped in oil of turpentine, to set fire to the whole inside of the shed at once. Soon after the fire was applied, the flames, being increased by the wind, were every where so violent that all the spectators thought they could not possibly be extinguished. I however succeeded, in about four minutes, by the method already described, with five buckets of water, part of which was wasted through the fault of those who assisted me, as the following experiment

I invited but very few to be present at this first experiment on the 8th of May, but on the 11th I repeated it in the presence of a very numerous company, after repairing and re-storing the shed to its original state. The fire was not less violent than in the preceding experiment. I then directed the water myself, without any assistance, and effectually extinguished the fire in three minutes, having used only three buckets of water, each containg about four gallons and a

Another experiment was made at Gotha, where a shed of openings. This device serves old and perfectly dry wood was erected, under the direction as a check to the sand in the of M. Van Marum, in front of the duchess's garden. Its di-center of the tubing, where the ons were in every respect equal to that which served current is strongest, and prefor the same experiment at Harlem, being twenty-four feet cipitates it down on the outlong, twenty wide, and fourteen in hight. There were two side next the sides of the pipe open to give the flames a free passage

To the bottom of these straw mats were fastened cotton wicks, dipped in spirits of turpentine, that the place in every part at once. In consequence, the fire, being considerably increased by the wind, was at first Patented Oct. 20, 1867, by R. N. Bennett of Branchport, N. subscribers will be forthcoming.

stances under which this experiment was made were highly unfavorable; for the wind drove the flame exactly out at the doors on the northeast side, at which the water for extinguishing it was to be introduced. But notwithstanding this, M. Van Marum placed a small portable engine before the door, nearest the southeast side, without regard to the fears and opposition of his assistants, and ordered it to be worked there, stationing himself as near as the heat of the fire would permit him; he first directed the water to the southeast side, as near the door as possible, and as soon as the flame was extinguished in one part he guided the water to another. He then directed it along the north east side, so that in a few minutes the flames were completely extinguished on those two sides. The engine was then placed before one of the apertures made in the form of windows, on the northwest side. He in a very short time extinguished the southeast side, and then coming to the middle of the shed, which was still on fire in several places in the crevices of the planks and the holes made by the nails, he completely extinguished the fire, which from time to time broke out again in small flames and this terrible conflagration was entirely got under. Ac cording to the calculation of several of the spectators, the fire was extinguished in three minutes at most, after the engine began to work, three buckets of water being used.

From what has been stated, it results, that to stop the most violent flame it is necessary only to wet the surface of the burning substance where the flame appears, and for this purpose only a small quantity of water is required, if it be applied with judgment to the burning part.

BENNETT'S DEVICE FOR SINKING WELL TURES,

The practice of procuring water by simply sinking or driving iron tubes to the water deposit, instead of digging and walling wells, is now quite common, and to facilitate the formation of such wells is the object of the contrivance herewith illustrated.

A represents the tubing, which is driven into the earth by positive force. In this is fitted

the shank, B, of the opening point, C. The point is made square in cross section or pyramidal in form, instead of round, as usual, the advantage of which is that it retains its position and preserves its direction better in driving and holds better in place when the tubing is partially raised to admit water. For a certain distance above the shoulder of the point the shank is cylindrical, fitting quite closely the caliber of the tubing. Above this point, D, it is beveled or chamfered, forming, above that point, a flat bar having a longitudinal slot, through which is passed a bolt, E, that also sses through the sides of the pips. At the top of the shank is a star-shaped diaphragm, which cuts off the passage in the center of the tube, and compels the contents to pass up around the outside of the diaphragm through the radial

doors on the northeast side, and two large apertures, in the where the friction will tend to prevent its ascension. Testform of windows, on the northwest side. The top was quite ing can be done at any time during the progress of the work. ers from Ca-tleton, Vt., two weeks ago, we stated that the It is done by raising the tube just above the point, D, enough club was made up by Mr. H.O. Osborn. The credit should The inside of this shed was covered with pitch, and after- to admit the water. It will be noticed that by securing the have been given to H. O. Brown. A gentleman from the wards with straw mats, plentifully besmeared with melted diaphragm to the top of the shank it will always stand at the place, calling our attention to the mistake of name, states came hight above the water, no matter how much the tubing itself may be adjusted up or down. This prevents the de- error, and adds that when the seventy men in his mill beposits of sand near the induction point.

Death by Lightning.

The effects of a shock of artificial lightning on a gentleman of our acquaintance, who is very sensitive to the electric discharge, may be here described. Under ordinary circumstances, the discharge from a small Leyden jar is exceedingly unpleasant to him. Some time ago he happened to stand in the presence of a numerous audience with a battery of fif-teen large Leyden jars charged beside him. Through some awkwardness on his part he touched a wire which he had no right to touch, and the discharge of the battery went through his body. Here life was absolutely blotted out for a very sensible interval without a trace of pain. In a second or two usness returned; the recipient of the shock saw him: self in the presence of his audience and apparatus, and, by the help of these external facts, immediately concluded that he had received the battery discharge. His intellectual consciousness of his position was restored with exceeding rapidity, but not so his optical consciousness. To prevent the audience from being alarmed, he observed that it had often been his desire to receive accidentally such a shock, and that his wish had at length been fulfilled. But while making this remark the appearance which his body presented to him was that of a number of separate pieces. The arms, for example, were detached from the trunk, and seemed suspended in the air. In fact, memory and the power of reasoning appeared to be complete long before the optic nerve was restored to healthy action. But what we wish chiefly to dwell upon here is, the absolute painlessness of the shock; and th cannot be a doubt that to a person struck dead by lightning, the passage from life to death occurs without conscious being in the least degree implicated. It is an abrupt stoppage of sensation, unaccompanied by a pang.-Harpers.

Manufacture of Iron.

From a paper read by Mr. Frederick Smith, and published in the Transactions of the Institution of Mechanical Engieers, we extract the following notice of the processe through in producing the different kinds of iron made at the Round Oak Works, England, and known as "common," "best," "best best," and "best best best:"-" 'Common 'iron is made from puddle bars from hot-blast mine pig, cut, piled, and heated with best coal for about an hour and a half in one of the bar mill furnaces, and rolled in the bar mill to the section required. 'Best' iron is made from a mixture of cold and hot blast pigs, but the top and bottom of the pile are of puddled iron that has been worked over twice at the hammer and forge rolls, so that all 'best' iron is worked over at least twice, while the upper and lower parts of the pile are worked over at least three times. 'Best best' iron also consists of a mixture of cold and hot blast pig, and is treated nearly the same as 'best,' only that the whole pile is worked over thrice at the hammer and forge rolls. 'Best best best' iron is made entirely of cold blast mine-pig, and rolled out into 81x4-inch bars. They are sheared into small snippings, and then run in barrows to the ball furnace, where they are worked together into a ball of about one cwt, in the course of a few moments. The ball is hammered and reheated in the furnace; hammered again, and then put through the forge rolls; the bars produced by these rolls are then cut up and piled, heated at a bar mill furnace, and rolled in the bar mill. In this process, to form 'best best best' iron it is heated five times, hammered three times, and rolled three times."-Bulletin of American Steel and Iron Americation

What Advertisers Say.

LAWRENCE, MASS., Dec. 24th, 1867.

MUNN & Co., SCIENTIFIC AMERICAN, New York:

DEAR SIRS :- Your favor is received, announcing increased rates for advertising. You will please continue our advertisement until forbid. Were we to curtail our advertising, the SCIENTIFIC is the last that we should withdraw from. We are yours, truly, J. C. HOADLEY & Co.

191 BROADWAY, NEW YORK, Dec. 24th, 1867.

MESSES, MUNN & Co. :

GENTLEMEN:-Yours at hand announcing advance terms for advertising. Please insert inclosed advertisement on your outside page until otherwise ordered. Even at your new prices this is the most profitable advertising I can do. I know it from the fact that I have expended \$12,000 in the leading journals, and no one has brought me the same profitable harvest as the SCIENTIFIC AMERICAN. May you al-GEO. E. WOODWARD ways prosper. Yours truly,

Use of a Grindstone.-Mechanics who value a good condition of their tools and other appliances for doing work, should never allow their grindstones to be used by strangers indiscriminately without some restrictions as to the manner of using. Every stone for grinding tools should be provided with a rest and the men taught how to use it.. We have razing by ten minutes' injudicious grinding. Such accommo dations are costly.

Correction,-In acknowledging a fine list of subscribthat Mr. Brown is too modest to call our attention to the come better acquainted with our paper another large list of

Labor the Basis of Republican Institutions.

If, as has been said, idleness is the mother of mischief, oc cupation and industry are the progenitors of virtue and good order. The universal haste for wealth, coupled with unwillingness to toil for its acquisition, is fruitful of crime and de structive of business integrity. Throughout the whole country the cities and towns are thronged with idle Micawbers, waiting for something to turn up by which they may become possessed of a fortune and pass their lives in luxurione case. Such men are the bane of society. They seem to believe that labor is degrading, and think nothing more honorable than sumptuous dependence. And yet society is filled with them. Not a reader of this paragraph but can point to those within his immediate acquaintance

The folly of the present age is its want of appreciation of true manliness. He is not the best type of American nobility who apes the foreign aristocracy and considers honest labor degrading and unworthy. The genius of our demothe exaltation of labor and the laborer; and its triumph is the vindication of toil from the contempt of an effete nobility that clings with the tenacity of life to ancient ideas and obsolete distinctions. We are a great and a progressive nation because we are shaping out our own destiny by the iron hand of labor. We have been singularly successful in our experient of self-goverment because we made it the first principle of conduct to depend upon ourselves for results, and not to hope for anything from ancestral title or inherited wealth. The founders of the American republic were men of independence. When they landed on these shores they shook off the trammels of European customs, they laid aside forever the pride of family that had enervated the youth of their native land, and with an unswerving fidelity to the great principles of Democracy, laid the foundations of a government whos corner-stone was respect for honest industry.

It was the law among the ancient Jews, that every man should learn a trade. He was not bound by any obligation to follow it, for if his inclinations prompted him to afterward seek anothe: profession, he was at liberty to do so. The wisdom of this law commends itself to every mind. If, in adverse times, misfortune should lay its hand upon them, and they should be compelled to leave their chosen pursuits, they were provided with an occupation which was a safeguard against extreme poverty or want. If such a law existed in this country it would prevent many of the evils that now prevail, and render our people more prosperous and happy. However true to the principles of democracy our fathers may have been, we are fast leaving them behind. Instead of honoring labor we are attempting to degrade it. Parents, ambitions for their children, often express the hope that their lot will not be so arduous or toilsome as their own has been, forgetting that by their labor the country has been blessed, and muse of the industry of their sons, generations yet to comwill be grateful that they were born in republican America.

It is the first duty of parents to instil into the minds of their children the necessity and the dignity of labor. To be useful in any sphere of life should be the ambition of our youth. Our vast fields of enterprise invite competition and premise satisfactory rewards. The producer is he whose loss is most felt by society. Success in mechanic art is as honors ble as professional eminence; agricultural industry is far more profitable to the nation than ambitious statesmanship. The watchwords of democracy are that all honest labor is able. It is not what one does, but the manner of doing it, that dignifies the man. Nothing can be more degrading than a quack in medicine, a pettifogger in law, or a blockhead in priestly garments-no one can be more hon than an industrious and skillful artisan or a faithful and intelligent tiller of the soil.

It is a mean and worthless spirit that despises the garb of the laborer and scorns to welcome him to places of equity. Nothing can be more false that our usual idea and definition of a gentleman. It is not the dress, it is not the employment that permits this appelation. It is the kindly heart, the industrious virtuous life that makes the gentleman. A career of idleness is generally a career of crime. It is not family or wealth that entitles one to honor. It is the intelli-gent manhood that entitles him to respect. We honor those who have risen from humble spheres of life to places of trust and usefulness, not because of the riches they possess, not because of the position they occupy, but because of the energy and industry which they manifested in the attainment of what they have. Fortune smiles on some while she frowns on others, but her favorite is no more entitled to honor than he who with equal industry strove to win her regard. The world's distinctions are often wrong. It is dilligent, patient labor that is to be honored by the true friends of republican institutions. The drone in society, whether po ed af millions or dependent upon public charity, should be despised and avoided by every honest man. We, as a nation. must change our ideas of nobility, or we shall decline in prosperity. He is only noble who uses to the best advantage the powers of body and mind with which his Creator has endowed kim. Any claim not founded on this is false and pernicious. When the people of any nation cease to give to labor its true dignity and affect to despise the laborer, their own dishonor is assured, and the doom of national prosperity is pronounced.—Eric Dispatch

Foreign Recognition of American Surgery.

One of the most competent of French surgeons, M. Bouvier, lately, in the most flattering terms, commended to the notice of the Academy of Medicine two forms of apparatus invented by Dr. C. F. Taylor, of 1,308 Broadway, New York City, and ed by Dr. C. F. Taylor, of 1,808 Broadway, New York City, and designed, the one for the correction of vertebral deviations consequent upon Pott's disease, and the other for the treatment of hip-joint diseases. The peculiar beauty of this apparatus is

that it combines all the advantages of horizontal position, as if the patient were reclining upon a bed, while at the same time the privilege is granted him of exercise and fresh air. In form, the apparatus is a simple lever which raises the superior part of the spinal column by using the transverse pros as a fulcrum, so that while safely increasing pressure on the articulations of the transverse processes, pressure on the bodies of the diseased vertebræ is considerably diminished. The instrument is hinged and acts as a supplementary vertebral column. Its arrangement is such that the degree of force employed may be modified at the discretion of the attending physician, and hence the treatment may be rendered contantly and regularly progressive.

Doctor Taylor is one of the most skillful practitioners, in the specialty in which he treats, in this country. For spinal and hip diseases, contraction of limbs, and kindred complaints, he manifests wonderful skill. His apparatus for straightening contracted muscles, and manipulating his pa tients by the use of the many mechanical contrivances he has invented and put in use at his rooms, are very ingenious. Instead of requiring his patients to conform to a special exercising chair or extending frame, or whatever other contrivance it may be necessary to use, he makes new applications to meet the form, size, and necessities of his patients, and from this source alone greater comfort as well as benefit, is administered to the afflicted, than is possible where a set of mechanical contrivances are made to perform the same office on various sized persons, although the maladies may be the same. Every case of malformation or disease of bone or muscle must be treated differently at certain stages, and Doctor Taylor has the requisite mechanical genius to make his own implements, and the skill and judgment requisite for their most favorable application. Doctor Taylor has published an illustrated work on the diseases of which he treats, which will interest the afflicted.

At the late Exposition, Dr. Taylor's apparatus was the ost noticeable feature in the section of orthopoedy, and in their official report the Imperial Commissioners incorporated the communication in full of M. Bouvier to the French Academy, as noted above, thus paying a marked compliment to his opinion, and making a double endorsement, in the most emphatic terms, of the merits of Dr. Taylor's inven-

Hints to Public Speakers and Singers.

When singing, writes Dion Boucicault, in the Pall Mall Gazette, the vowels are principally used because it is necessary to dwell upon a note, and we cannot prolong a consonant. In speaking, on the contrary, we depend for articula tion on the consonants, but their short percussive sound does not travel. When we short, or in open air speaking, which partakes of shouting, we prolong the vowels, drawing the syllable at each word, but what we gain in sound is lost in clearness of articulation; expression is lost in monotony; because its fineness depends on the infinite variety of which the consonant is capable and bestows on the vowel. Two thousand voices singing or speaking together, travel no further than one voice. They may fill a certain area more completely with that intricacy of waves which, when very troubleome, we call a din, but each voice exerts its own influence on the air according to its power, and dies away within certain limits. A second voice acts independently, and produces its own separate effect, not fortifying the first but dis tinct from it; and so with any number of voices-say ten thousand-shouting together, if a single trumpeter were placed among them, the notes of his trumpet would be heard clearly at a distance where the Babel of voices would have expired in a murmur. Yet among the din produced by the ten thousand notes the trumpet would be inaudible. To illustrate this theory more clearly, it is plain that two thou sand persons cannot throw stones further than one person It is true that the air within certain limits will be more full of stones, but they will all come to the ground within a lim ited area.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The existence of the gold fields of Nova Scotia is probably known to but few of our readers, yet a report,—a little rose-colored, perhaps,—which has been sent us while recording progress and results, claims that compared to the extent of gold producing area, the quantity of quarts mined, or the number of men employed, these fields are by far the most productive in the world. In 1998 the yield of gold was 25,545 unoses; for this year, according to every indication, it will exceed 20,680 ounces, the gross value being \$600,000, or one half the value of their great staple, the coat yield. During the six years since gold was first discovered here, about 45,000 of the precious metal has been found. The average amount to each miner last year was 57 grains per day; its value, about \$2.50. There are less than 500 persons engaged in the mines. The future prospect for these mines is cheering, both American and Canadian capitalists are investing in them, and means are being taken to work them on a larger scale and system, insuring larger returns and less waste. The existence of the gold fields of Nova Scotia is probably known

At the last conterence of the associated North German railways, resolutions were passed looking to the promotion of the comforts of the traveling public. Among others, it was decided to warm the passenger cars by circulating a continuous current of hot water in pipes through the whole train. The heating apparatus occupies a special car, which is piaced next the locomotive, and short lengths of India-rubber pipe will form connections between the cars.

Canadian railroads carried two and a haif million passengers last year and killed only seventy-seven of them. Their receipts were eleven millions or less than ten per cent of the cost. Nearly nine thousand persons are employed, of whom alm cet two thirds belong to the Grand Trunk road alone.

California has found a new source of wealth in her iron deposits. It is claimed that there is scarcely a county in the State in which the mineral is not found in greater or less value. The Coast Bange, though never oughly explored for iron ore, has many and extensive surface dep which indicate considerable richness.

ces, the Metropolitan Tramway company having given notice of in application to Parliament to lay down rails for six different roads.

Two tuns, or 16,000 yards of wadding, is the daily product of one establish-tent in Pawincket, B. J. In addition to this amount, the works turn out early three tuns daily of cotion waste, for use in cleaning machinery.

We have noticed in many of our exchanges the astounding announcement that a Canadian inventor has constructed an arrangement for coupling cars automatically. Let him come to our Patent office and we will show him a nundred such contrivances, and the exhibition might be repeated every month with an entirely new stock, fully equal in variety and ingenuity to those now on hand. The number of these self-couplers annually patented is astonishing, but railroad companies seem reluctant to adopt them.

NEW PUBLICATIONS.

DICKENS' WORKS.

T. B. Peterson & Brothers, Philadelphia, are isaning an edition of Dickens' works so cheep that almost every one can afford a complete set of this entertaining author's writings. Martin Cauzdewit, Domboy & Son, Richolas Nickelby, and Christmas Stories are the three works already reproduced in this cheap form. Price 25 cents each.

Geo. Routledge & Son, London, and 418 Broome street, New York. Price &3 a year; 25c., single numbers. This new monthly is one of the most entertaining of the many magazines now publishing. The illustrations are well done, and the subjects generally partake of the humorous, and vividly portray incidents in the stories in which they appear.

Becent American and Loreign Latents.

der this heading we shall publish weekly notes of some of the more promi-nent home and foreign patents.

MACHINE FOR MAKING MOLDS FOR STERBOTYPING.-John McNair, New ns, La.—This invention relates to a new and improved device whereby letter types may be pressed directly into a plastic substance and a stereotype mold obtained direct, or without the trouble of first "setting up " the type nce and a stereotype and then taking a cast from them, as is now practiced

LOCK.-H. Jackson, New York city.-This invention consists of an expanding stump arranged in relation with sumblers and a slide bolt of peculiar ing stump arranged in relation with tumblers and a since both of peculiar construction, whereby a greater security than hitherto is obtained against the picking of the lock; and the invention further consists in corrugating or notehing one edge of the tumblers and having a pin on a alide to engage with the notches and prevent the tumblers being moved or tampered with by a pick when brought in contact with the stump, which arrangement also serves as a safeguard against picking. The invention also consists in a novel manner of attaching the springs to the tumblers, and also in a step for the tumblers.

GRAVER.-Ralph S. Mershon, Zanesville, Ohio.-The principal object of this invention is to so construct a graver that it can be readily adjusted and set a upon a surface, whether more or less concave or hollow

SEED PLANTER.-Joseph R. Frantz. Goodville, Pa.-This invention consi of seed hoppers supported upon a carrying or supporting frame, the sides of said hopper being operated by gearing from the driving wheel, and of cover ing shoes also operated by said frame, by means of which the seeds are planted and covered at the same time.

CHURN.-Thomas Payne, Grand Rapids, Mich.-This invention relates to a new and improved churn of that class in which a rotary dasher is employed, and it consists in a novel manner of constructing the dasher, whereby it is believed that the cream is acted upon in a more favorable manner than hitherto for the expeditious production of superior butter

EXTENSION LADDER.—Hosea Barnes, Somers, Wis.—This invention consists in connecting together several sections or lengths of a ladder (three, more or less) in such a manner that the sections may be rigidly connected so as to form one continuous length when required, and admit of the lengths being folded when not required for use, and also adjusted so as to form a step lad-

GLOBE VALVE .- John B. Lowell, Baltimore, Md .- In this invention a new levice is employed for grinding the valve to its seat without removing th

BURNING CULN AND OTHER FUEL.-Alfred Dart, Carbondale, Pa.-In this invention the stove is so constructed that the fuel will be by trata, in order that oxygen may pass freely through it, and thereby better

FIELD ROLLER.-8, B. Mann, Indianapolis, Ind.-In this invention the roller is a hollow cylinder in which are placed heavy metallic balls, for the arpose of increasing the weight without changing the bulk of the appa-is. The spring that supports the seat is also arranged in a novel manner.

AUTOMATIC GATE.-Charles F. Mawbey, Woodbridge, N. J.-In this invention a platform is arranged on each side of the gates, and connected with them by a peculiar and exceedingly simple and effective device. When a corse of other weight comes upon either platform the gates fly open from him. As the horse passes through and steps upon the other platform, the latter operates to hold the gates open till the carriage has passed, when they swing together and latch by their own weight.

COMBINED PLANTER AND CULTIVATOR .- John Vaughn, College Grove, an .- This invention consists in a new combination of the planter, cultivator, revolving hoe, plow, scraper, and revolving rake, by means of which every operation required in raising cotton can be performed with one in-strument, and fifty per cent of the time and labor required by the old meth ods can be saved.

LANTERN.-J. H. Richardson, Philadelphia, Pa.-This invention relates to a new and improved lantern, designed more especially for ship and railroad lanterss. The invention consists in feeding the flame with oxygen from the top of the lantern, a direct draft upward from the boltom through the top of the same being avoided, whereby the flame will not be liable to be ex-tinguished by gusts of wind or the swinging of the lanters, as is now the case with those which have a draft of air passing through them from the bottom upward and are exposed to or carried in the open air.

PERCE.-H. A. Kephart, Fletcher, Ohio.-This invention relates to a new and improved feace for farm purposes, and of that class which are com-monly termed portable, and it consists in a novel manner of applying the stakes to the panels, whereby the feace may be firmly supported in positakes to the panels, whereby the fence may be firmly supported tion with the bottoms of its panels above the surface of the ground.

IMPROVEMENT IN DEVING AND SEASONING LUMBER.-E. C. Bender, York, Pa., and Wm. Steffe, Philadelphia, Pa.—This invention relates to a new and improved process of treating lumber, for the purpose of drying and see ing it, and is designed to remody serious detects in processes haretocore ado, ted for that purpose, which is most effectually accomplished, by the gase of a close chamber, or kiln, provided with proper fines and dampers, for controlling and regulating the temperature and discharging the moisture, by which means the pores of the wood are kept open a sufficient length of time to allow of the absorption and carrying off of the moisture from the interior as well as the exterior, thus seasoning without injury by checking otherwise, and with less attention, labor, and fuel than by any other proc therwise, and with less attention, lab-atented Dec. 17th; see claim in last is

HORSE AND WAGON BRAKE.-G. Haberland, Pontine, Ill.-This invention relates to a new device for preventing horses from running away, and con-sists in arranging straps around the horses' legs, which are connected by suitable lines or cords, with a drun fitted to the front part of the wagon. By revolving the drum, the lines will be wound around it, and the horses fact will be drawn together, preventing the horse from running.

ROAD SCRAPER.-L. W. T. Lodge, Petersburg, Ky.-This invention relates to an improvement in the construction of scrapers for excavating road beds and other similar purposes. CAR COUPLING.-Robert Goole, Abingdon, ill.-This invention relates to

HAND TRUCK FOR MOVING BARRELS.-T. W. Kennedy, Avon, III,-This in vention relates to a new and useful improvement in the com-hand truck for moving barrels about from place to place in a

SHARPENING HORRENOE CALKE.—N. Hays, Wm. Duncan and E. A. Bowen Vinton, Jowa.—This invention relates to an improved tool for sharpening the calks on horseshoes, and consists in the combination of a hand lever, clamping and a circular rasp or cutter operated with a crank by which the calks on a horseshoe are rapidly and effectually sharpened on the horse's foot.

CULTIVATOR.-Charles E, Storrs, William E. Keyes and David W. Je Grandville, Mich.—This invention consists in forming a cultivator plow with its sides curved upward resembling a scoop and provided with a cutting edge to facilitate its reseage through the soil, the whole attached to a

FEED MOTION FOR HEAD BLOCKS OF SAW MILLS .- M. C. Lewis, Glasgow Mo.—This invention relates to an improaement in the feed motion device of the head blocks of a saw mill each lever being so arranged that both the head blocks may move simultaneously or work separately.

Overs.-John Adam Kinkele, Sacramento City, Cal.-This invention re lates to a new and improved method of constructing overs for baking bread and other articles, and it consists principally in a revolving hearth or bot-tom and in hot and cold-air fines in connection therewith.

GATE.—John Shartle, Lima, Ind.—This invention relates to an improve ment in gates and consists in so constructing and hanging the gate that it can be raised and lowered in position for overcoming obstacles, such as snow.

ARIMAL TRAP.—W. H. Davis, Lexington, Ind.—This invention relates to an improved animal trap, and consists of a box the floor or trap door of which is pivoted in the walls. A crauk shaft having its bearings in the walls of the box and operated by a spring or weight is connected with said floor by a connecting rod or pitman attached to the floor by a staple.

MEANS FOR SECURIFG JIG OR MULEY SAWS TO THEIR SLIDBS.—Win. It man, Middletown, N.Y.—This invention relates to a new and improved mear for scouring jig or muley saws to their sildes, whereby the saw may be ver readily secured to and detached from their sildes, and when secured to their firmly held, without the possibility of becoming detached.

INDICATOR FOR STRAY BOILERS, ETO.—James Slater, Philadelphia, Pa.— This invention relates to an improved and novel construction of a valve, or indicator for steam and other boilers, etc., and in the manner of suspending a weight thereon, whereby many important advantages are secured.

FROME.—Augustin Ellis and Oliver Albertson, Salem, Ind.—This invention relates to a new and improved portable fence, such as is designed to be readily put up and taken down. The invention consists in a novel application of braces, or supports to the fence, and the manner of constructing the panels together, whereby a firm and substantial straight fence is obtained, and the "worm" or zigzag fence avoided.

TOOL HOLDER FOR SLIDE RESTS .- Israel F. Brown, New Lonndon, Conn This invention relates to a new and improved tool holder for silde rests and other machines, and it consists in the employment or use of a V-shaped gib, or key, in connection with notches in the tool and a slot in the tool holder, all being arranged in such a manner that the tool may be held firmly in po tion in the tool holder, and at the same time be capable of being readily it ted in and removed therefrom.

FILTER.—George W. W. Goodwyn, New Orleans, Le.—This invention con-ists in a novel arrangement of a filtering machine, with a water vessel and sists in a novel arrange a vessel to receive the filtered water, whereby a very portable combination of a filter and water chamber is obtained, and in connection with a cooler is

APPARATUS FOR PAPER MAKING MACHINES AND OTHER MACHINES HAVING TRAVELIES WERS AND FARRICS.—F. Thiry, Huy, Belgium.—The object of this invention is to restore the endless cloth or wire on which the pulp or paper travels (in the manufacture of paper and the webs or fabrics in other manufactures) to its true course, when from any cause it has a tendency to depart therefrom.

LAMP BURNER.-Charles W. Russell and Niel Clifford, New York city. This invention relates to a new and improved lamp burner, designed burning coal oil and other similar volatile hydro-carbons. The invent consists in a novel form or shape of draught chimney, in connection with a cone or deflector arranged in such relation with each other that the flame of the burner will be supplied with a requisite amount of oxygen to support combustion and produce a brilliant filluminating flame.

COPY HOLDER.-Herman A. Tremper, Hammonton, N. J.-This invenrelates to a copy holder, intended for the use of compositors, and also for the use of proof readers, book keepers, lawyers and copyists, by substituting a change of support, so as to allow of its being used on a table or desk.

COMBINED THERMOMETER AND CANDS .- James L. Rober, Philadelphia, Pa This invention relates to a new and improved method of using thermometers, whereby the same are rendered much more convenient for reference than they have hitherto been, and consists in constructing the index-plate of a proper form and attaching the thermometer permanently, or enclosing it in the wood or other material of walking cases, umbrellas, parasols, lookingglasses, etc.

MACHINE FOR BORING POST-ROLES.-Wm. R. Iles, Lancaster, Ohio. invention relates to a new and improved machine for boring post-holes in the earth, and consists in operating an earth auger, by an uprigh shaft, by cranks and gearing.

MACRINE FOR BENDING HOOKS.-R. B. Sears, Providence, R. I.-This is vention relates to a new machine for bending wrought fron, or oth into the required shape, and consists in the use of a stationary die, to which the lower emd of the bar, which is to be bent into a hook, is held by means of a follower, carrying a pin, that fits through an eye formed in the lower end of the book-bar

TRACK AND STREET CLEANER.-Ernest Abbiati, New York city.-This in-TRACK AND BYZERY CLEARER.—Ernest Abdist, New York ety.—Into invention relates to a new device for cleaning railroad tracks and streets from snow, and consists in the use of a revolving, horisontal disk, carrying oscillating wings, which are drawn in and out by the sotion of crank shafts, revolved by means of genr-wheels from the shaft to which the disk is secured. This shaft is secured to the front part of a truck, which moves in front of the locomotive or ear, or to the front part of a wagon or car, and receives rolary motion from one of the wheels of the locomotive, car, or wagon, rolary motion from one of the wheels of the locomotive, car, or wage or from any other suitable device.

CORN PLANTER.—Hans J. Johnson, St. Peter, Minn.—This invention has for its object to furnish an improved machine for planting corn, cotton sagar came, and other seeds, in hills which shall be easily operated, and so

oscopa.—Oscar Goerke, Brooklyn, N. Y.—This invention has for its object to simplify and improve the construction of stereoscopes so as to make them less expensive in construction, and more effective and conveni-

HAY FORE.-L. N. Tinkham, Sylvania, Penn .-This invention has for its object to furnish an improved horse hay fork, simple in construction, easily operated, and effective in operation

TRE-SERRIKKING MACHINE.—Jacob Gessemy, Donigal, Ponn.—This invention relates to an adjustable tire shrinker, which can be set to bend the tires to fit different wheels, and which is so arranged that it will require but very little power to bend tires of great strength and thickness

FOLDING MACHIER.—Lercy A. Gleason, Southington, Conn.—The object of this invention is to construct a machine for booking sheet metal so that with one folding bar, either sharp or round bends can be made thereon, and that it can be adjusted for any thickness of metal, and for any desired length of

STRINGE VALVE.—Nathan Lawrence, Taunton, Mass.—This invention re-ates to a new manner of securing the valves in the metal valve cylinder of a syringe, so that the said valve cannot drop out of its place. The inven-

tion consists in securely arranging a pin across the metal cylinder in which the valve is held, whereby the aforesaid object will be attained.

GATE AND BARN DOOR FASTERING.—W. W. Pock, Cassapolis, Mich.—This invention relates to a new fastening for gates and barn doors, which is so constructed that the gate or door can be opened from the inside and outside, or from the former only, as may be desired, and be that the same cannot be raised and opened by logs and other animals.

FOLDING GATE.-Robert Gidley, Lagrange, N. Y.-This invention relationship to a new folding gate, which can be easily opened or closed by persons it a carriage or on heresback. It consists of a picket gate, pivoted to a bar which is suspended in a poet, so that, when the said bar is awung back by means of suitable levers, the gate will also be swung back with the bar.

REPLECTOR.-Wm. Ulrich, Newars, N. J.-This invention relates to a new reflector, which is so arranged that it can be easily attached to or detached from gas burners or lamps of suitable description, and that it can be revolved around the same, so as to throw the light or shade to any desired spot, and which can be folded out of the way if desired.

HOOP-SAWING MACHINE,-George H. Shearer, Bay city, Mich .- This invest tion relates to a new manner of arrenging the bearings for the axies of the feed rollers and saw of a gang sawing machine for cutting laths and hoops, and consists in so casting a bearing for each end of all the axies of a sawing machine, that those, or any one of those of the feed rollers can be removed whenever desired.

Banjos.—Jerome Mayberger. New York city.—This invention relates to a new manner of arranging the sound board of a banjo, and consists in the use of an annular drum or box, which is covered by a board having 5-shap-ed holes similar to those in the sound board of violins. The parchment head is secured to a ring, which is fitted upon the sound board, enough above the same to permit the escape of the vibrating air between the said head and the drum, while the circular open space in the center of the drum serves as a channel for a new number of air. serves as a channel for a new supply of air.

VALVE.—Alfred Crossley, Brooklyn, N. Y.—This invention relates to a new valve for steam and water pipes, and consists in so arranging the parts that the packing is below the acrew thread, by which the stem is moved in the connet, so that the water will not come in contact with the screw thread; the

Taves .- J.R. Blake and J.L. Jarrell, Dyer Station, Tenn .- This invention e sists of a band or belt, adapted to embracing the body, around the bowels, to an under strap of which belt the hernia pad is applied by a loop, in such manner as to be succeptible of adjustment within a vertical and horizontal or lateral plane, and in either plane independent of the other.

PURIFYING TRAY.—B. E. Chollar, Leavenworth, Kansas.—This invention consists of poctinated bars, of any desired form, forming the ends of the tray. In the spaces between the teeth grate bars are placed, and the same are held in position by other bars or clamps, which said clamps are belted down upon said grate bars

ARIMAL TRAP.—Augustine Ellis and Oliver Albertson, Salem Co., Ind.— Phis invention consists in a novel construction and arrangement of the trap, whereby many important advantages and features are secured.

NAIL MACRIFE.—Adrian Shaw, Westford, Mass.—This invention consists principally in hanging the hammer or hammers to the outer ends of a revolving beam or cross-arm, in such a manner that as such beam revolves the hammers will be thereby swung down and upon the anvil-block, which at the same time being moved upward then recodes or moves down again at the same time as the hammer draws up from the anvil-block, from the continued rotation of the helve or beam carrying the sa

WHEEL CASTER.-Jos. White, Providence, R. L.-This invent WHEEL CAPTER—Jos. White, Providence, E. L.—This invention consists of the same to receive metallic balls, on which the under plate, to which the wheel is attached, resis, whereby the supporting arms of the wheel move more freely and with less friction around the spindle.

HARNESS PAD .- John Maclure, Newark, N. J .- The object of this invention ITALIESS FAD.—John Maclure, Newark, N. J.—The object of this invention is to so construct a pad plate for a barness pad that the mountings or trimmings can be easily changed without destroying, or in anywhe impairing the the beauty or utility of the pad, and also so that the changest as well as the most expensive kinds of pads may be made on the plate.

MACHINE FOR MAKING PLUS TORAGOS.—J. E. Withers, Toronto, C. W.— This invention relates to a machine for making plug tobucos, and comists of a series of rollers pressing the tobacco is troughs, running on flamps rollers, a large wheel revolving in a transverse direction, shifts the troughs on to a ecries of rollers, revolving in the opposite direction, by which they are car-ried back to the end from which they started. An inclined knife removes the tobacco from the troughs when sufficiently pressed.

MACHINE FOR FORKING TUBULAR BRADE ON SERRY METAL GUTTERS FOR ROOFS.—O. W. Stow, Figurestille, Conn.—Sheet metal gutters for roofs are constructed of thin metal plates (most generally termed sheet iron,) bent in semi-circular shape, with a tubular bead formed on the center edge in order to stiffen the gutter and keep it in proper shape. This invention relates to a new and improved machine whereby a very simple and portable device is obtained; one which may be constructed at a small cost, and operated with the greatest facility.

SEED PLANTER AND CULTIVATOR.—M. B. Snodgrass, Jamestowa, Ohio.— This invention relates to a new and improved seed planter and cultivator combined, and it consists in a peculiar construction and arrangement of the several parts, whereby the machine may be made to work in either of the above named capacities in a perfect manner.

DE FOR REMOVING BURRS AND OTHER VEGETARIE MATTER FRO Wook.—Wm. Sykes, Newton Lower Falls, Mass.—This invention relates to a modification and improvement of a process for removing burrs and vegetable matter or substances from wool, for which Letters Fatent were granted to this inventor bearing date July 10, 1865.

SKATE-George Brownlee, Princeton, Ind.—The present invent sists, ist. In transversely dividing the foot rest or support to the skate at a point between its toe and heal, and where the ball of the foot will rest upon the same, into two parts or sections that are hinged together, in combination with the runner or blade, also similarly divided, but so termed at their joint with the runner or blade, also similarly divided, but so formed at their joint that as they are opened, as it were, by the action of the pressure by the foot upon the support or rest of the state, the unner will present an unbroken and continuous surface or edge to the ice or other ground on which the state is used. At, in arranging upon the under side of the foot-rest or support, a driving jaw or claw or claws, in such manner that by the movement of the foot-rest or support, in the act of skating such claws will operate upon the ice or other surface, in a manner to propel or to assist the skater forward; the arrangement of the jaws being such as to be susceptible of adjustment at pleasure, and as may be found necessary. Ad, in securing to the side of the runner blade to a skate and along its length a parallel edge, by means of which the direction of the skater is turned, as he leans over upon the side corresponding with such edge. the side corresponding with such edge.

EXTENSION NOTICES.

Ambrose Nicholson, of Poland, M. Y., having petitioned for the extension of a patent granted to him the 21st day of March, 1284, for an improvement in self-fastening shatter hinges, for seven years from the expiration of said patent, which takes piace on the 21st day of March, 1886, it is ordered that the said petition be heard at the Patent Office on Manday, the 2d day of

Marinda Starks, of Genos, N. Y., administratrix of the estate of issae Starks, deceased, and Lyman Perrigo, of Groton, N. Y., having petitioned for the extension of a patent granted to the wald Issae Starks and Lyman Perrigo the 18th day of June, 1824, for an improvement in device for holding the problem period was the extension of self-activities. pieces in spoke machines, for even years from the expiration of said patent which takes place on the 19th day of June, 1866, it is ordered that the said potition be heard at the Patent Office on Monday, the 35th day May next-

Horace Smith and D. B. Wesson, of Springfield, Mass., having petitis for the extension of a patent granted to them the 8th day of August, 1854, for an improvement in caririages, for seven years from the expiration of said patent, which takes place on the 8th day of August, 1988, it is ordered that the said polition be heard at the Patent Office on Monday, the 29d day of June next.

Answers to Correspondents.

OORRESPONDENTS who amount to receive answers to their letters must, in all cases, ago, their assess. We have a right to know those who seek in-premation from us; besides, as comelimes happens, we may profer to advers the correspondent by mail.

SPECIAL NOTE: This column is designed for the general interest and inservation of our readers, not for gratisless replies to questions of a purely business or personal assure. We call publish such inquiries, homeor, when paid for as alterisements at 60 cents a line, under the head of "Business and Ferrances."

IF All reference to back numbers should be by notume and page.

C. F. R., of Conn., claims to have a recipe for a paint-the principal ingredient of which is coal tar—admirably adapted to preserving the bottoms of ships. He has also a plan for rendering wood fire-proof, but neither gives the recipes nor offers to sell the preparations. He says: "Perhaps your readers would be pleased to obtain them on the same terms as those of water-proof fine fabrics: well, let them, I have no objections." Which must be very catisfactory to the "readers."

J. F., of La.-Concrete for foundations is made usually of one part hydraulic cement and two parts clean sharp sand, into which as mixed, is thrown five parts broken stone, the whole to be deposited at once in place. No amount of water, whether sait or fresh, can impair it.

P. S., of N. J.-Horn is merely a generic term applied to several widely differing animal substances. The horns of the stag, moose, antelope, etc., are very different from those of the genus book, as domestic cattle, and that of the rhinocerce differs from both. Treatment for one of these qualities of so-called horn in manufacturing will not do for others.

G. W. S., of Mass.—Gutta-percha is a perfect non-conductor of electricity and is used because of this quality for submarine and under-ground telegraphic wires. Its non-conducting quality is not surpassed by any known material.

J. J. D.-Microcosmic salt, Syn: with phosphorus salt, salt urisal nativum is the triphosphate of soda and ammonis and is found in certain kinds of guano. Still it is not extracted from them, but prepared directly in heating 6 parts of phosphate of ammonia, 1 part of sai ammonia and 2 parts of water in a porcelain vessel, when in coofing it will be obtained in coloriess needles. In recrystallizing them, having previously added some ammonia, the sait is obtained perfectly pure. As far as we know, it is only applied as a flux in blow pipe analysis.

V. F. L. Common recks would will be little calling it.

W. E. L.-Common rosin melted with a little gallipoli oil and spirits of turpentine has been found to answer very well for preserving polished ironwork bright. The proportions should be such as to form a coating which will adhere firmly, not chip off and yet admit of being hed by caucious scraping.

H. B.—The following is a recipe for the preparation of yeast given us by a brewer: 78 lbs. of unkilned mait together with a handful of hops are gradually stirred in a clean tab containing 7 gallons of water of 170° Fah., and to this 5½ gallons of water of 200° are added. The tub is then covered tightly and left quiet for one hear. Supposing this to be done at P. M., the whole is left undisturbed till 7 A. M., when it must be ecoled rapidly, which is done by setting in cans filled with cold water. When the temperature of the mash has reached 20°, the tub is covered again and left during the day till 6 P. M.; at this time 1½ gallons of fresh beer years are to be stirred in. In 13 hours pierce a hole in the layer formed by the husks of the mait and dip 3½ gallons of the liquor beneath, then stir the whole up and dip 1½ gallons from it (hunks and liquor). This is your mother-barm from which you can generate yeast all the year round in using it in the way described instead of the ordinary beer leaven. To the remainder in the tub add 5 gallons of work of 50°, and make use of it within two hours. The mother yeast also must be used the same day for fermenting 170° Fah., and to this 5% gallons of water of 200° are added. The tub is then hours. The mother yeast also must be used the same day for fe

H. M., of Hawksville, asks: "Can you tell me the reason why a wrought-from plow runs caster than a cast-tron one and yet a cast-iron sleigh shoe caster than a wrought-iron shoe?" 1. The closer-she grain of the metal employed for mold boards in plows the least friction. 2. Our correspondent will have to furnish as with better proof than the mere statement that sleighs shod with east from run with less friction than e shod with wrought iron before we can answer his que

W. S. R., of Pa, asks for the recipe of a good writing ink. 135 parts of logwood are exhausted by a boiling with 1,600 parts of water, and to the strained decostion one part of biohromate of potassa in solution is added; the ink thus obtained will not give any precipitate nor become

R. C., of Ill., asks for the means to restore stoves which turn red from use. Apply the ordinary stove polish once or twice a week and your stove will not change to that rusty red of which you comprain. . . . The application of provence oil to the head will remove dandruff.

C. I. H., of N. Y.-Rubber or gutta-percha would not be in-

Business and Lersonal.

The charge for insertion under this head is one dollar a line.

Camden Tool and Tube Works Co., Camden, N. J., Manufacturers of Tube and the most improved Tools for Stea.
Tube Manufacturers.

Parties in want of Fine Tools or Machinists' Supplies send

Allen & Needles, 41 South Water street, Philadelphia, Manturers of Allen's Patent Anti-Lamina, for removing and preventing

Can anybody tell us the price, and where steam saws are to be had for cutting tree logs into cord wood, the saw attached direct to the piston rod? Address Munn & Co., this office.

Wanted-A full set of machinery, with steam engine, for a ad circulars to O. J. Boilinger, Planing, Sash, Door, and Blind Mill. Se Millwright and Mill Coutry actor, Glens ek. Pa

Wanted-A first-class Molder, with capital of one or two

A cheap Iron Planer wanted, about 7 feet by 33 inches square. Jas. E. Coxeter, Winchester, N. H.

Copper Tubes Wanted.-Manufacturers who can make copor brass tubes % or %-inch in diameter, and 1-66-in, thick, will please I their address and prices to Dr. J. B. Buchanan, Louisville, Ky.

A Schoenberg & Co., 840 South Front st., Philadelphia, Pa.,

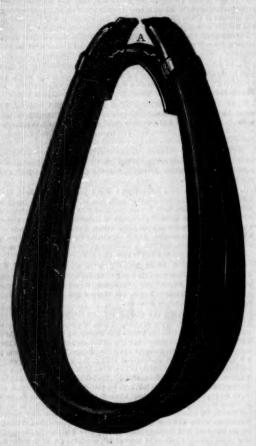
That Good-Will case is settled by the Supreme Court of Mass. E. C. Tainter is successor to J. A. Fay & Co., Worcester, Mass. Address as above for first-class Eastern-made wood tools.

Manufacturers of large Kettles for Oil and Soap Manufacies, will please send circular and price list to J. P. Bab R. L.

Winans' Boiler Powder, 11 Wall et., N. Y. proves réliable in removing or preventing scale-12 years in use. No better reference need

ALVORD'S ELASTIC HORSE COLLAR.

In the annexed engraving is shown an improvement in horse collars, patented Aug. 28th, 1866 by Clark Alvord, of Westford, Dodge county, Wis. It consists of an elastic coupling at the top of the collar, as shown at A. The first advantage resulting from such coupling is that the collar can be easily put over the horse's head when harnessing, and as easily taken off, no unbuckling to be done. Second, the coupling being elastic and fastened a short distance below the top of the collar, the bearing upon the neck is a spring which keeps the collar up to the lower part of the neck, yet not so rigidly as to choke the horse when drawing.



The top being open renders the collar adjustable, so that the movements of the shoulders of the horse when traveling do not cause the bearing of the collar to twist about upon, and when trotting, pound his neck. Hence no sore necks, as often happens with collars of the usual make.

For further information address the patentee, at Westford, Dodge county, Wis. See advertisement on another page.

THE ANTIQUITY OF MAN.

The New York Lyceum of Natural History were address at a late meeting by Prof. J. H. McChesney, of the University of Chicago, formerly United States Consul at Newcastle Eng., who, just returning from a visit to the different Euro pean localities where evidences of great antiquity of the human race have chiefly been found, was enabled from personal investigation to present some new and interesting facts rela tive to this subject.

After referring to the flint implements found in the drift at Kempston and Biddenham, England, at St. Acheul, near Amiens, France, he spoke at some length of a locality in Italy not so well known as the preceding, but which furnishes al most indisputable proof of the presence of man upon the earth long ages anterior to the six thousand years which has generally been considered as limiting the period of his existe here. The evidence is the recurrence, in the drift stratifica-tion on the banks of the river Tiber, of flint arrow heads and implements which could only have been modeled by the hand of man. Now this accumulation of boulders and pebbles forming the drift is derived entirely from the Appening mountains, and no trace exists in it of the Latin mountains, chain now lying intermediate between the Tiber and the Appenines, but which is thus proved to be of later origin. Far above the drift is a layer of volcanic tufa derived from the latter chain, and this forms the foundation for towns which existed long before the building of Rome. Dating now from the latter event: from the known rate of disintegration of the rock forming this foundation, an approximate calculation can be made as to the period which has elapsed since the forms tion of the Latin hills, and it must be admitted that six thousand years is by far too limited a period to ascribe to the time of man's continuance on this mun

In the discussion which followed the highly interesting re marks of Prof. McChesney-of which we have given above but the crudest summary-Prof. Hitchcock spoke of several cases which had come under his observation where so-called antiquarian traces might be easily explained away. The President replied that proof in the subject under consid cumulative; that while isolated cases might perhaps be explained, when the evidence is found in widely separated re ns and under different conditions, it is but reasonable to cknowledge some connection existing between them.

subject of man's great antiquity bore to the most important question of the age, i. e., the unity or diversity in origin of the human family. The early relics of the "stone age" are found in both Americas, Europe and Asia, but their rude form proves that they were fashioned by tribes not excelling in either ingenuity or skill, and it may well be questioned whether—supposing we admit the claims for the plateaus of Central Asia as the birth place of the race—they were posessed of sufficient enterprise to traverse Europe, or, on the other hand, to scatter through Asia and reach the New World by the perilous passage of Behring's straits.

FRANKFURTH'S FUNNEL HEAT RADIATOR AND DAM-PER.

With all the improvements in the construction of stoves, furnaces and other heating apparatus, much of the heat is wasted by passing off through the chimney. When a rapid draft is desired probably this waste, or a portion of it, is unavoidable, but devices are in use which retard the passing off of the products of combustion and yield a portion of the heat which otherwise escapes. Of the many contrived the engraving accompanying this description represents one of which the patentee says that 1,400 have been sold and not one returned as not having given perfect satisfaction.

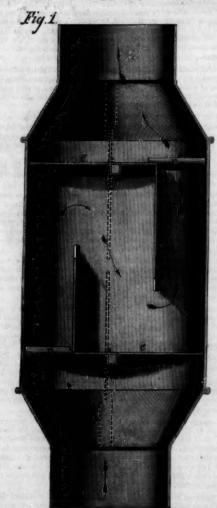
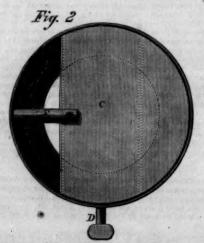


Fig. 1 is a vertical section of the drum containing the radiing partitions and dampers, Fig. 2 is a plan view of one of the dampers closed. The drum may be considered an enlargement of the stove funnel having longitudinal partitions A, fixed midway between the axis of the drum and its exte rior. B are shafts of the dampers, C, turned by the handles-one shown at D, Fig. 2. It will be seen that the dampers are



segments of a circle, the uncovered or open portion having attached a weighted bar, E-both figures-as a balance When the dampers are closed as in Fig. 1, a space between the rim of the damper and the inside of the cylinder is free or open. The dotted lines in Fig. 1 show the position of the dampers when turned to give ample room for the escape of

manent partitions. The arrows in Fig. 1 give the course of the up-rising gas

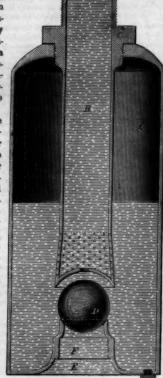
When a fire is started in a stove or furnace to which this device is attached, the dampers, C, are opened to give the fullest draft. When the fire is well under way the dampers are closed and the gaseous products of combustion follow the direction of the arrows, and impinge on the inner surface of the drum, imparting their heat through this medium to the room. This device was patented through the Scientific American Patent Agency. January 24, 1865. All orders or communications relative to it should be addressed to Wm. Frankfurth, 306 Chestnut street Milwaukee, Wis.

HILTON'S IMPROVED AIR CHAMBER FOR PUMPS.

The object of the device exhibited in the engraving is to provide a method of procuring a steady and uniform current,

and of straining the water from foreign matters held in solution or sedimentary deposits. The engraving presents a central vertical section of an air chamber showing the arrangement of the parts.

A represents the shell of the air chamber, and B an interior tube attached to the top of the chamber by an air-tight connection, C. The end of the tube is perforated, forming a concave strainer directly over the ball valve, D, which has its seat on the conical cham-ber, E. The lower tube of the pump is connected to the se tion of pipe, F. The annular space around the conical chamber, E, is a place of deposit for the sediment, which may be removed at the screw



The water or other liquid being forced into the chamber through the lower tube, raises the globe valve, and passe into the chamber until the compressed air between its level and the top of the vessel, by its reaction, forces it through the strainer out through the discharge pipe, B, the strainer preventing any foreign substance from passing into the tube, and the conical form of the combined valve and the inlet chamber facilitating its deposition on the bottom of the vessel. The concave bottom of the strainer secures the return of the globe valve to its seat after having been raised.

This patent was obtained through the Scientific American Patent agency, November 19, 1867, by Richard H. Hilton, assignor to Mitchell, Allen & Co., who may be addressed relative to the invention, at Newbern, N. C.

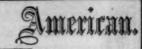
Protection of Life in Public Buildings.

A suggestion from the dramatist, Dion Bourcicault, in regard to the protection of life and property from fire in places of public entertainment, which we find in one of our city exchanges, is worthy of notice. He proposes a plan like this: -Above the stage, and co-extensive with it, there is a gridiron floor, from which hangs the pendent scenery. Let the timbers of this floor, which is open work, be laid on their under-face with lines of small iron pipe, forming a gridiron pricked at every inch with holes; let this system be in communication with the water main. Let one lever which turns on the water be against the wall of the stage on the inside, another corresponding lever contiguous but on the outside, so that the water may be turned on by a person either outside or inside the building. The effect of this operation would be to let fall a continuous and even deluge, more effectual in checking fire than the jet from the hose, because it not only addresses itself to the seat of the fire, but to adjacent material. A similar gridiron process should be introduced underneath the stage; another on the rafters over the auditorium, and a fourth in all available places around the ceiling, so placed that the rain from such would fall or be projected or the wood-work of the boxes and stalls. Each of these systems into operation separately; yet the whole might be under the operation of one master main, by turning on which the whole theater, from the back of the gallery to the rear of the stage, could be deluged in a momen

sens. C. A. Stevens & Co's., jewelry establishment on Union Square, this city is one of the most elegant and complete houses of the kind in the city. It is the pioneer establishment of that portion of the town, and is well stocked with fine jewels, plate, bronzes, etc. The firm have ascociated with them Mr. Emile E. Evers, well known from his former connection with Mesers. Ball, Black & Co

In annealing hard cast iron or steel oxide of iron is useful, Prof. Seeiey called attention to the relation which this the gases, and those in Fig. 2 show the position of the per. The scales of the forge should be saved for this purpose.

Scientific



MUNN & COMPANY, Editors and Proprietors.

FUBLISHED WEEKLY AT

AO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN. S. H. WALES. A. E. BEACH.

13 Messrs. Trubner & Co., 60 Paternoster flow London, are also Age for the SCIENTIFIC AMERICAN. ** "The American News Company," Agents, 121 Nassan street, New York "The New York News Company," 8 Spruce street.

VOL. XVIII., No. 2....[New Series.].... Twenty-third Year.

NEW YORK, SATURDAY, JANUARY 11, 1868.

COM	CALCO.
(Illustrated articles are	marked with an asterisk.)
*Improved Steam Engine for Rolling Mills teport of the Acting Commissioner of Agriculture Sub-Aqueous and other Tunnels 16 Oil Well Pumping 19	New Publications Recent American and Foreign Patents Extension Notices
at the Paris Exposition. 19 Tasking Iron by Magnetism 20 *Improvement in Sheep Shears 21 Science of Extinguishing a Fire 21 *Bennett a Device for Sinking Well Tubes 22	*Hilton's Improved Air Chamber for Pumps Protection of Life in Public Build- ings Railroad Accidents—is There a
Labor the Basis of Republican In-	The Commissionership of Patents 2 Communication betweenNewYork, Brooklyn, and Jersey City 2
stitutions 22 Foreign Recognition of American Surgery Hints to Public Speakers and Sing-	Bessemer Steel-Is Its Superiority Established? Locomotive Engineers—Their Responsibilities and Estimation
Manufacturing, Mining, and Stall-	Patent Claims

RAILEOAD ACCIDENTS .-- IS THERE A REMEDY!

Whether the notion that boiler explosions, shipwrecks railway collisions, and other moving incidents by fire or flood, are the results of an epidemic, the causes of which are be yond our ken and control, is true or not, it is certain that the past two or three months have been prolific in at least one class of these appalling catastrophes—that of railroad accidents. It would be a useless harrowing-up of the sensibilities of our readers to relate the particulars, which they have probably read in other journals; but it may be well to refer to some of the circumstances attending these lamentable occurrences, with a view to discover some remedy which may be employed to mitigate the horrors, if not to prevent the

repetition of such accidents. The throwing of cars from the rail, and their after precipitation down a steep incline, appears, if we may judge from the accounts of such accidents, to be due to a number of causes, among which we shall not reckon the breakage of axles, etc., except merely to refer to them, as these depend mainly on the carefulness and good judgment of the iron-worker, or are of a character to be detected, by the employes of the road, in season to prevent serious consequences. But according to varying statements in regard to the late accident at Angola, N. Y., on the Lake Shore road, by which about forty persons met a miserable death, the last car of the train was thrown from the track at a "frog," because of a break in the flange of one of the wheels, or because of the spreading of the track, or because of the improper position of the wheels for the track, the car being known as a "compromise" car, adapted or intended to run on tracks varying in width between the rails. Perhaps some of our readers will not understand what a compromise car, or a compromise truck, is. It is simply a truck which is intended to run on a track of either four feet eight inches or of four feet ten inches spread, these being the varying gages of the New York Central and Lake Shore roads. The compromise car wheels are made wider than common car wheels on the tread, and allow, of course, a "play" or lateral motion of three quarters of an inch. Possibly we may never know the real cause of this accident, which precipitated two passenger cars down a steep embankment, killing half a hundred, and

maining or wounding as many more. The soundness of car wheels is tested generally by an ex pert passing along by a train at stations, and tapping the wheels with a hammer, by the sound of which he judges of their condition. Probably experience will enable the operator to detect any flaw or crack in the body of the wheel, but hardly the fact of a piece being broken out of the flange, which portion may be hidden by the rail, so as to be invisible. According to the testimony taken before the coroner's jury, the track at Angola was in good condition, and perhaps the use of the compromise trucks may, after all, have been the real cause of the accident. Either of the conjectured cause are measurably within the power of man to remove; the latter certainly is.

But if the throwing of a car from the track cannot be certainly prevented, the splintering and demolition of the car as 1851, we published, on page 388, a description, with illustrations, of an iron passenger car, contrived by Mr. T. E. Warren, of Troy, N. Y., made either of plain or corrugated wrought-iron. It was elegant in appearance, light, substantial, and safe; but, after struggling for years, and spending his substance to procure its introduction, Mr. Warren became discouraged, left Troy, and, we believe, has since died. The New York and New Haven railroad has adopted for one car on a train a method of heating, entirely safe, and infinitely better every way than that by means of stoves burning wood for a while, is likely to be nominated as Commissioner of fuel. It is a single coal stove, provided with a water-back

tion of hot water is kept up. A small stove is used, which can be rigidly secured to the car, and no easily-opening door or cover be left to discharge the coals among the passengers, in case the car was thrown down the embankment. In Germany a boiler-car has been attached to a train, with pipes leading through every car. This, as well as a proposition from a correspondent to use steam direct from the locomotive, has objections which will likely prevent its introduction. The plan of the New York and New Haven road appears to be the ost feasible we have seen tried or heard suggested.

There would appear to be no adequate reason for adhering to the use of kerosene or other inflammable and explosive fluids for lighting the cars of a train. The horrors of the Angola accident were doubtless enhanced by the ignition of the oil contained in the lamps; and the burning of four ladies sisters—and one man in a car near Cincinnati, and the destruction of a mail car in Jersey City by the overturning of a kerosene lamp, are fresh in the minds of all. Gas, condensed in receivers attached to each car, and replenished at each end of a route, or at intermediate stations, would prevent the addition of fury to the flames of a burning car. It would seem that the adoption of such obviously effective preventatives might save the passengers of an overturned car from the ad-

ditional horrors of a death by fire.

It is stated that after the car leaped the track at Angola, and after the signal to "down brakes" was given, the train moved from 1,000 to 2,500 feet with one, and-a part of the distance-two cars off the track before its headway was stopped. All accounts agree that if the train could have been stopped ten seconds sooner, the accident would have been comparatively trifling in its consequences. On pages 78 and 102, Vol. XVII., we gave accounts of trials on the New Jersey Central railroad of a steam brake, invented by Mr. William Loughridge, of Paterson, N. J. By reference page 102, last volume, it will be seen that the steam brake brought the train to a stand-still from a speed of 50 miles per hour, in a distance of 721 feet, while the same train, at the me speed, required 1,817 feet to be stopped by hand brakes. Many otherwise disastrous accidents might be wholly prevented by the use of such a device. Frequently the danger if ahead, is not descried in time to bring the train to a halt before the locomotive has arrived at the point, especially if the track is slippery, the train on a down grade, or running at full speed.

The Norwalk, Conn., accident, some years ago, occasioned by an open draw at a bridge, has been followed, from time to time, by others, caused by misplaced switches and open draws. The carelessness or inattention of switchmen or draw-tenders eemed to be beyond remedy; but this carelessness is now without excuse, as may be seen by referring to page 277 of Vol. XVI. of the SCIENTIFIC AMERICAN. The magnetic switch signal and alarm there described and illustrated, appears to be effectual in preventing accidents from these case the invention of Mr. Thomas S. Hall, of Stamford, Conn., and is in daily and hourly use on the New York and New Haven road. At Stamford it has been employed for the past six or eight months at the depot, where there is a constant succession of trains and a frequent use of the sidings, yet it has never failed to exhibit the danger signal and give an alarm whenever the switch was moved from the main track. Its mechanism is so simple as to be almost impossible to get out of order, and its first cost and subsequent expense is trifling. For a description we refer our readers to the article men tioned above : the utility of the device is shown in its success ful use where introduced.

From the above it appears evident that it is from no lack of devices, intended to guard against railway accidents, that they are of so frequent occurrence-from no lack of contrivces, the value of which has been determined by repeated experiments—yet the slaughter of human life and the destruction of valuable property still goes on, apparently unchecked. It may be asked: "Why are not these appliances and improvements adopted?" The answer must be made by railroad managers; we are unable to give a reason. It is certain, however, that the inventor has to seek and beg, as a favor, that test of his improvement which should be made as a right, which the safety of the public, if not the interest of the inventor, demands. Inventors of appliances for saving human life on railroads, and preserving railroad property, are too often treated by railroad corporations as swindlers having a design upon the corporation treasury; and even after proving the usefulness and value of their inventions, they are re fused the adoption of their improvements and the con compensation. Indeed it is rumored that a number of our railroad companies in the New England and other States have combined to contribute a fund, ostensibly to defend themselves against malicious and vexatious prosecutions by inventors claiming improvements in use on the roads, but which is used to embarrass and "worry out" in litigation those whose brains, talents, and time have been employed in this direction.

and the burning of its inmates are preventable. As long ago proved effectual in the use of appliances calculated to deprive pieces, something which could not possibly have occurred to railroad travel of some of its dangers. There are some hos- an iron rail under similar circumstances. The Engineer beorable exceptions, two of which are mentioned above, but it lieves that the tests already made in regard to the comparais probable that nothing short of legislative enactment will render travel on our railroads free from the constant fear of the convincing proof which time and use only can supply. death or maiming.

THE COMMISSIONERSHIP OF PATENTS.

Congress from Connecticut, and also Commissioner of Patents Patents again. He is now President of the N. Y. and N. H. placed upon the effect continual vibration and concussion exand pipes, a single coil passing under each seat and returning to the leading pipe. By this means a constant circulation of Commissioner of Patents and his adding time they will more or less change the condition of the Railroad, and has had large business experience. He for- orts upon iron and steel, but it is certainly underiable that

ministration was characterized by marked ability. Mr. Bishop's appointment would give general satisfaction. name of Mr. Alfred B. Ely, was largely mixed up with that position last week, but we believe he has retired from the field. The name of Mr. Fox, of the Interior Department, has been suggested; also, ex-Gov. Farwell, who is now an examiner in the Patent Office. Governor Farwell is able and experienced. We should be glad to see him in the Commissioner's chair.

COMMUNICATION BETWEEN NEW YORK, BROOKLYN AND JERSEY CITY.

We publish in another column accounts, furnished by a correspondent, concerning the construction of sub-aque tunnels, with a view of showing the feasibility of establishing this means of communication between New York, Brooklyn and Jersey City. From these accounts it would seem to be no very difficult or expensive work to connect these great cities by a single tunnel which, although of small dimensions, . would have an immense carrying capacity for passengers. Indeed through the proposed eight-foot tunnel it is stated that twice as many passengers can be conveyed as are now carried on all the combined Brooklyn ferries, and there would never be any interruption of travel by snow, ice, fog or col-lision. The proposed tunnel would be about the same in cross section as the Croton aqueduct which is 534 feet. This great tube is over forty miles long, and was built in five years' time at an expense, including right of way, land, dams, bridges, reservoirs, and other large extrane ous expenses, of about sixty dollars per running foot. The actual expense of constructing the tunnel proper did not probably exceed twenty dollars per running foot. We should be glad to receive information upon this point.

The area of the proposed sub-aqueous railroad tunnel as described by our correspondent is sufficient to take in cars of about the same interior accommodations as ordinary railway

It is well known that the beds of the North and East Rivers are of such a nature as to present no serious obstacle to the laying down of tunnels. Undoubtedly the quickest and best way would be to dredge a ditch deep enough to contain the eight-foot tube and sink the same below the bed of the river; the construction and laying being executed on the plans of Trevethick and other distinguished engineers.

Between Brooklyn and New York the sub-aqueous portion of the tunnel needs to be only 2,000 feet in length, and an enterprising corporation might readily put it down and have

it in operation in six months' time.

It is surprising that an intelligent legislature like that of the great State of New York should be disposed rather to hinder than to encourage its citizens in the construction of important public works like this. But it is a fact that the last legislature actually rejected the petition of the applicants for a tunnel charter, and granted charters to two companies for the erection of immense bridges between New York and Brooklyn. Only one of these bridges has been closely figured upon, so far as we are informed, and the cost of its construction is ascertained to be seven millions of dollars, and the time required for erection between four and five

A tunnel could be laid down and put in operation four years in advance of this bridge, the construction of both being commenced simultaneously. During these four years the stockholders of the tunnel would probably receive back their capital, two or three times over, in the shape of dividends.

The bridge will cost fourteen times more than the tunnel; ensequently, in order to pay the same interest on its cost as the tunnel, the bridge must yield to its stockholders an inme fourteen times greater than the tunnel.

It seems absurd to expend seven millions on a bridge when a tunnel costing one-fourteenth part of that sum will be able fully to accommodate the public. We learn from credible sources that the bridge project has been suspended for the present, owing to the difficulty of obtaining subscriptions.

BESSEMER STEEL-IS ITS SUPERIORITY ESTABLISHED!

A late number of the Engineer in a cautious article concernsemer steel, assumes that although that, or steel of some kind, has been claimed to be superior to iron for ship construction, guns, armor plates, shot, girders, locomotives, and rails, the proof has yet to be produced. "The use of steel for shipbuilding purposes continues to be very limited in-deed; steel guns are things of the past, Herr Krupp's doings to the contrary notwithstanding. We have little to hope from steel in the shape of armor plates. Girders, boilers, and locomotives continue, and apparently will continue to be made of iron, though steel has been fairly tried." The article goes on to show that in the use of steel for rails we are with out sufficient data to warrant the change from iron rails which is so strongly urged by the advocates of the former; and cites as an instance of the possible unreliability of steel The only resort appears to be legislation. This only has for this purpose the breaking of a Bessemer rail into three tive merits of Bessemer steel and iron lack, for the former,

So far as Bessemer steel as applied to railroads is conce we are not prepared to take issue with the Engineer. It is certain that Bessemer rails have not been so thoroughly We learn that Hon. W. D. Bishop, formerly Member of tested either in this country or England as to warrant a wholesale rejection of good iron rails and the adoption of steel by any cautious engineer. Perhaps too much stress has been

material. Too many instances of the change by these cause of a fibrous texture to a crystalline structure are well authenticated to leave any doubt upon the subject. Not only do railway axles made of the toughest wrought iron invariably show a crystalline character when fractured, but even the axles of public carriages, subjected only to the jar of stone payed streets, present a similar appearance when broken. Whether this effect is often produced in iron rails, at least as laid in this country, where we allow "give" or spring and use wooden sleepers, we cannot say; every break we have ever seen appearing to be due to an original defect in the rail or to the inferiority of material. Still every forger knows that it is comparatively easy to make the toughest steel brittle by cold hammering. While an iron rail might retain its fibrous character until so worn on the face as to require replacement, the Bessemer steel rail might, from its superior resistance to wear, even if not from its inferior resistance to the crystallizing process, be in an unsafe condition internally while presenting a fair external appearance.

Under these circumstances it would seem that good management and discretion require that the substitution of steel for iron rails should be at present limited, and they be placed at such points on the road that while they could be exposed to the most thorough trials of frequent and heavy trains they could be examined daily and their condition be constantly known. The superiority of Bessemer steel over wrought iron in tensile strength, weight for weight, as it comes from the manufactory may not be a matter of doubt; indeed all experiments seem to prove it beyond a peradventure, but the life of Bessemer rails and the changes they may undergo while being used on the road are to be ascertained only by

We think, however, that the Engineer goes too far in as serting that for other purposes Bessemer steel has failed to meet the expectations of its advocates. According to trials made at Manchester, Woolwich Arsenal, and the statement of such authorities as Fairbairn, Templeton, Scott Russell, and others, Bessemer steel has proved superior to the best cast steel and toughest wrought iron in tensile strength, the Bes semer requiring a breaking weight of 162,970 pounds, while Sheffield cast steel, ranking next in tenacity, broke with 130,000, and Swedishiron with 72,000. Thus it would seem that for permanent structures as bridges, buildings, ships, etc., not subjected to concussion and where lightness is a favorable if not a necessary quality, Bessemer steel deserves a foremost place in engineering material.

LOCOMOTIVE ENGINEERS.—THEIR BESPONSIBILITIES AND ESTIMATION.

It may be doubted if any class of mechanics are so inade quately appreciated as locomotive engineers. Few others have responsibilities equal to theirs and none have more as duous and dangerous duties. The terms of their qualifications for the positions they hold are rigidly exacting. Generally they must serve a novitiate in the locomotive building or repair shop, and then a year—perhaps more—in the po-sition of fireman or "greaser" before a machine is entrusted to their care. They are expected to have gained a sufficient practical knowledge of the locomotive engine, not only to run it and keep it in order, but to make at least temporary re pairs in an emergency.

It might be supposed, under these circumstances, that their work would be appreciated by the public generally, or at least by their employers; yet it is seldom we hear of any recognition of their services, and presentations of merit by railroad companies to engineers are so few that it is difficult to recall an instance. Yet recorded occurrences of rare heroism on the part of locomotive engineers show that they are a noble class of men, and many cases of heroic self sacrifice have occurred which have never been publicly noticed. Instances of engineers sticking to the foot-board and throttle even in the plain and immediate view of almost certain death are not unknown; choosing rather to achieve a posthumous reputa tion for courage than to retain a life saved at the expense of

The employment of the locomotive engineer is one of continually recurring perils. He stands as Uriah in the "fore front of the battle;" if there is danger ahead he is the first to see it and must be the first to meet it. If death comes to any it must come probably to him. And frequently he is without any warning as to what danger may be before him, and without signal or guide to avert it. In the darkest nights, when the fog may be "cut with a knife," he must drive his unpitying steed, over tressel work, bridge, and culvert, either of which may have been undermined by torrents or storms or burned by sparks from the locomotive of a preceding train, even if the evil passions of men have not com bined to provide the means for a catastrophe. Miles away from the habitations of men, he may have no assurance that kindly hearts will prompt to timely warning. He cannot rest, cannot relax for a moment the vigilance which is the price of safety for himself as well as the hundreds of human lives behind him. Overlooking-his fireman, noting the hight of the water in his boiler and the pressure of the steam, keep ing his eyes directed ahead and his hand on the throttle valve or reversing lever, he must be continually wide awake and watchful while on the road. Such labor is exhausting it affects the mental as well as the physical powers.

The jars and jolts of the locomotive are believed to tend greatly to the impairment of the engineer's health. The vidence and extent of these shocks can be understood only by those who have ridden the iron horse. The passengers in the unholstered cars conceive but a faint idea of the movements of the locomotive from the easy swinging of the cars. At times the whole machine, with its tuns of moving weight,

appears to leap from the track; it jerks from side to side of the road as if a sentient organism in spasms, and shakes the engineer and fireman in every fiber of their bodies. With all this the engineer must not allow his attention to be diverted from his duty. He gets to learn the present condition of his machine even by the noise it makes as it echoes through cuts or tunnels or spins hummingly along the open track. If a single thing is wrong his educated ear detects in the darkest night what his obscured sight fails to discover.

The perpetual strain upon the mind—the sense of never mitigated responsibility—and the continual facing of possible death or disaster more or less affects the mental character of the locomotive engineer. He partakes of the character of his machine-of which he becomes insensibly a part-and is some times rough, perhaps, in manner, always ready, and blunt in his communications with others. But from his position and the demands of his office he seldom speaks—never converses -when on the engine. Thus he becomes in time taciturn in manner, although not in reality. This brusqueness and reticence if not a part of his duty becomes a part of his character, and even if time permits, he seldom allows himself to unbend in social life. With such responsibilities as he bears levity soon becomes gravity, and light heartedness, serious

It is not too much to say that the locomotive engineer, rather than the conductor, is the real manager of a train The latter mingles with the passengers, and being ostensibly what his title imports, he receives the credit for a favorable issue out of a threatened danger, which more properly, in many cases, belongs to that isolated individual, the loco tive engineer.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING DECEMBER 24, 1867. Reported Officially for the Scientific Americ

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the to

1	eing a schedule of fees:-
1	On filing each Caveat. \$10 On filing each application for a Patent, except for a design. \$15 On issuing each original Patent. \$20
ı	On appeal to Commissioner of Patenta.
ı	On application for Reissue
ı	On granting the Extension
1	On filing a Disclaimer. 310 On filing application for Design (three and a half years). 410
I	On filing application for Design (even and a native at 3.00 on filing application for Design (seven years)
١	In addition to which there are some small revenue-stamp taxes. Residents
I	ot Canada and Neva Scotia pay \$500 on application.

IF Pamphists containing the Fatent Laws and full particulars of the n of applying for Letters Patent, specifying size of model required, and m other information useful to Inventors, may be had gratte by address MUNN & CO., Publishers of the Scientific American, New York. del required, and muci

72,439. — TRACK-CLEARER. — Ernesto Abbiati (assignor to

72,439. — TRACK-CLEARER. — Ernesto Abbiati (assignor to himself and John N. Longhl), New York city.

I claim, ist, The application to a track and street cleaner, of oscillating wings, H H, operated by means of crank shafts, E E, to which planetary motion is imparted, substantially as herein shown and described, and for the burpose specified.

2d. The oscillating wings, H, when arranged upon and operating in combination with a revolving disk, D, all made and operating substantially as herein shown and described.

3e. At the oscillating wings, H, in combination with the brushes, I I, all made and operating substantially as and for the purpose specified.

72, 440. — MORTAR MILL. — Alfred A. Anderson, Galesburg, III. I claim a mortar-mixing machine, consisting of the case, A, provided with a hopper, B, deschable end piece, A, and the gear wheels, b c, arranged to operate a granding or mixing cylinder placed within the hopper, the whole constructed and mounted on a carriage, substantially as described.

72, 441. — CAR COUPLING. — Cyrus P. Bachelder, Franklin, N. H., assignor to himself, Daniel Barnard, and Stephon Kenrick.

I claim to sparatus for raising links, connisting of the case, a, a, with its handles, a', and brackets, b, in combination with the rods, d, spiral springs, h, and cross piece, e, all operating substantially as and for the purpose described.

72,442.—Device for Attaching Postage and Revenue 442.—DEVICE FOR ATTACHING FOSTAGE AND REVENUE STAMPS, BYO-Charles II. Bacon, Springfield, Ohlo, claim the case, A, having knives, G, with inclined edges projecting from interior faces, in combination with the follower, B, substantially as and the purpose set forth.

445.—CARPENTERS' PLANE.—L. Bailey, Boston, Mass. claim the auxiliary point of impact between the cap and the thin plane, at the point or portion thereof where the thin steel tends to buckle for the pressure of the cap apon the projecting edge of the plane iron, satartially in the manner described.

under the pressure of the cap upon the projecting edge of the plane iron, substantially in the manner described.

72,444.—EXTERSION LADDER.—Hosea Barns, Somers, Wis. I claim the hooks, D., attached to the side pieces, a, of the sections or lengths, B.C., when the latter are connected together by the rounds, c. passing through oblong slots, d, in the side pieces, a, and the lower ends of the latter are provided with notches, b, to fit over rounds, e, all arranged in the maner substantially as shown and described.

72,445.—TRUSS.—John Randolph Blake, and John Lewis Jarrell, Dyer Station, Tenn.

We claim, list. The pads, when applied to the under strap of a body belt, substantially as and for the purpose described.

20, The side straps, H, in combination with the above, substantially as described, for the purpose specified.

the states as as a first of the state of the states of the

New London, Conn.
I claim the notches, dx, in the tool, in connection with the wire, c, or its equivalent, in the V-groove, in the gib or key, substantially as and for the

SKATE.—George Brownles, Princeton, Ind. claim, ist, The foot rest or support, and runner or blade, of a skate, when naversely divided, substantially as and for the purpose described.

A foot rest or support to the skate, when provided with a driving jaw is nutstantially as described, for the purpose specified.

As the substantially as described, for the purpose specified.

As the purpose described, as the purpose specified.

As the purpose described.

As the purpose described.

As the purpose described.

in, ist, In combination with a rod or torsion door spring, the sore ted cam or worm, G, or an equivalent thereof, as described, engagi he notched burr or wheel, D, on the end of the said torsion rod, for i purpose of graduating the tension thereof, substantially as described.

2d, in combination with the above, the double socket or receiver, E, for supporting the notched wheel, D, substantially as described.

72,450.—GUIDE FOR WATER WHEELS.—Nathan F. Burnham,

ADDO-GUIDE FOR WATER WHEELS.—Nathan F. Burnham, York, Pa.

I claim the suide constructed with a bevelied surface, as at 7, such bevelied surface forming one side of the entire throat, formed by the respective pairs of guides, nubstantially in the manner and for the purpose described.

72,451.—WASHING MACHINE.—Jacob B. Byers, Geneseo, Ill.

I claim a washing machine, having the stationary inclined corrugated board, a, with the inclined bottom, B, all arranged as shows and described.

72,452.—MUSKETO AND FLY NET.—Eiben O. Carrington, Philadelphia, Pa.

I claim the polynonal bars, c, with end spring sections, in combination with the tages or strips, and fold, f, as and for the purposes specified.

72,453.—BASIN FACET.—James Chambers, boston, Mass.

I claim the combination as well as the arrangement of the two valves, F G, their seats. h, it he passage, k, the valve chambers, be a standard, A, and the stem, E, provided with operative screws, o, sa specified.

Also the combination as well as the arrangement of the mozie, B, the standard, A, the stem, E, its operative screws, o, the valves, F G, their seats h i, and chambers, b c, and the stem, E, the operative screws, o, the valves, F G, their seats h i, and chambers, E, c, the standard, A, the stem, E, its operative screws, o, the valves, F G, their seats h i, and chambers, b c, and the passage, k.

Also the combination of the tube, e, the flagre, f, and the two elastic annuals, it is also their arrangement with respect to the screw joint, a, of the pairs, A C, as described, of one of the valves, F G, with its stem, by means whereby one may be adjusted thereon, with reference to the other, for the purpose of terminating the movement of the nossie, as described.

72,454.—WATER WHEEL.—Rockwell Chapman, Buchanan,

Mich.

I claim a water wheel consisting of a radially projecting hub, B, having the bucket -, a, formed therein alternately on opposite sides, each bucket extending half way across the face of B, as shown in Fig. 3, and having the discharge passages formed on the sides by the overlapping plates, 1, applied descharge. as described.
72.455.—Tray for Gas Purifiers.—B. E. Chollar, Leaven-

worth, Kansas.
I claim, ist, A purifying tray substantially as shown and described and for se purpo e set forth.
2d, The grate bare, a, in combination with the pottinated bars, A, and the inders or clamps, B, substantially as shown and described and for the purpose of forth. binders or clamps, it, substantially as shown and the best poles set forth.
72,456.— DOUBLE CULTIVATOR PLOW.— Philip Coonrod,

Keithsburg, Ill. I claim the cultivator consisting of two separate gangs of plows, G. G. each gag constructed of curved fron bars, g.g., as described, and adjusted by means of clevis. H. and box, C. both constructed and operating substantially as herein set forth. In combination with axietree, A. constructed as described, boxes, D.D. and draft rod, E. substantially as set forth. 72,457.—SHUTTLE.—George Crompton, Worcester, Mass. I claim, in combination with the bobbin spindle, the spring, f, and strut, k arranged to operate substantially as set forth.

Also the hinge larch plate, I, the spring, s, and the stop plin, t, when combined and stranged together, and relatively to the bobbin spindle, substantially as set forth.

79 458—SPEAM EXCHANG GLODNE VALVE—Alfred Crossley.

bined and arranged together, and relatively to the boots spatially as set forth.

72,458.—Steam Engine Globe Valve.—Alfred Crossley, Brooklyn, N. Y.
Iciaim, Ist, The chamber, c, in the upper part of the bounes, E, above the scroth bread by which the valve stem is raised and lowered, so that be smooth bread by which the valve stem will not come in contact with the screw thread in the bounes, substantially as herein described.

7d. The arrangement of the packing, F, boanes, E, and its recess, c, whereby to exclude water or steam from the screw thread in the interior of the bonnes, substantially as herein shown and described.

72,459.—Burglark Alarm.—Benj. F. Cunningham and Jeff. F. Cunningham, Fiora, Ill.

72,409.—DURGIAR ADARS.
F. Cunnicham, Flora, Ill.
We claim the arrangement of lever wire, D, in combination with wire, E, for the purpose herein specified.
72,460.—ARTIFICIAL FUELL—Aaron M. Daniels, Hartford, Conn., assignor to himself and Benjamin Benett.
1 claim a compound for artificial fuel substantially as described.
72,461.—ARIMAL TRAP.—W. H. Davis (assignor to Joseph

Harlan). Lexington, Ind. Harlan, 1st, The crank shaft, C, operated by the spring, d, or its equiva-, in combination with the trap door, B, substantially as above set forth and described.

3d, The bars. G, in combination with the trap door, B, substantially as

specified.

8d. The trigger, F, substantially as described, in combination with crank haft, C, and trap door, B, substantially as above set forth and described.

12,462.—HARNESS DNAP.—Wm. F. Davison, Oliver A. Bates, Samuel M, Wilson, and Alva P. Russell, Janesville, Wilson, and Alva P. Russell, Alva

poses described.

2d. Hook, a. ring, b, and spring, c, when all constructed, connected together, and used substantially as and for the purposes described.

72,463.—Screw Driver.—Otis Dean (assignor to Dr. R. W.

73,465.—SCREW DAIVER.

Young), Richmond, Va.
I claim, ist, A screw driver capable of being varied in length substantially
in the manner set forth.

2d, Also the combination of the notched blade, B, and locking spring, C,
constructed and arranged to operate sa and lor the purpose specified.

72,464.—TOOL FOR OPENING CANS.—Goo. A. Dickson, Wood-

cock Township, Pa.

I claim the catting tool, constructed as shown at fig. 3, when the same is in combination with the cylinder, D, and the india-rubber packing. B C C, and the collar, E E, constructed as described, for the purposes set forth.

72,465.—MACHINE FOR BORING ROCKS.—Frederick Bernard

Dearing, London, Eng.

1 claim, ist, Constructing engines or machinery for boring or working in ock or other mineral, in which the pistons of the small cylinders are operated by motive fluid, distributed by the main cylinder, without having been reviously utilized in the main cylinder, as herein described.

24, Constructing engines or machinery for boring or working in rocks, or there mineral, in which the main cylinder itself distributes the motive fluid tidistinct portions of the stroke to other cylinders, as in the arrangements level described.

other imbrat, in wheel see main symmetrises assistants the motive man at distinct portions of the stroke to other cylinders, as in the arrangements herela described, engines or machinery for boring or working in rock or other mineral, in which the piston of the main cylinder, with the tool, has the required rotary motion imparted to it by a twisted bar, or equivalent, in combination with other parts, as herein described.

72,463.— STAND FOR ROCK-DRILLING ENGINE.—Frederick Bernard During, London, Eng.

I claim, 1st, The combination of parts, substantially as herein described, in the combination of parts, substantially as herein described, and arrangements may have more than one point of support, and the earlies be therefore prevented turning round the carrying column, as shown in the drawings annexed.

2d, The combination of parts, in frames or stands, for boring or cutting engines, of a pivoted saddle or bow, with collars, columns and arms, with their clamping arrangements and moving goar for allowing the engines of a pivoted saddle or bow, with collars, columns and arms, with their clamping arrangements and moving goar for allowing the engines of reservoirs and a tank for water, having the necessary inlets and outlets, substantially as and for the purpose herein described, and shown in the figures.

3d, The combination of parts of rames or stands to be employed in sink-fault, The combination of parts of rames or stands to be employed in sink-fault, and the stands of the purpose herein described with reference to figs.

72,467.—HEAD REST.—A. Dunlap, Clyde, Ohio. I claim the section, A, consisting of the wire frame, C, and cr ranged in combination with sections, B B', when constructed sockets, F, and cushions, E and H, in the manner and for the socially as set forth.

stantially as set forth.
72,468.—LATHE TOOL HOLDER.—Jacob Edson, Boston, Mass.
I claim the arrangement of the clamp-holding projection, a, and the clamp,
B, with the shank, A, and one or two cutters, C C', applied thereto, as speci-

l, with the shank, A, and one of two cutters, U.V. apputed metero, as specified.

Also, the holder shank, A, as made with the suxiliary projection, d, aranged with it and its clamp projection, as specified.

Also, the holder, as made with one or more notehed or toothed grooves constructed in its bead or front end to receive one or more tools or cutters leld against such notches, as explained.

eld against such notches, as explained.

cois with the single holder and its clamp, as specified.

Also, the holder, as made with each of its grooves curved lengitudinally, a and for the purpose above specified.

Also, the yoke of the clamp, as formed with the cap or cover, to extend ver the projection, as, and that pare of the screw of such clamp which exceeds within the projection receiving recess of the clamp.

9.420 Everyer A durnatin Ellis and Oliver Albertson. Sa-

over the projection, a, and that part of the screw of such clamp which tends within the projection receiving recess of the clamp.
72,469.—FENCE.—Augustin Ellis and Oliver Albertson, Sa-

Tem, Ind.
We claim the obliquely projecting bars or bases, D, attached to the panels, A, substantially in the manner as and for the purpose set forth.

2,470.—ANIMAL TRAP.—Augustin Ellis and Oliver Albert-

son, Salem, Ind.

We claim, ist, The combination of the lids, D.E., to the bait-box, A., tilting, which cloor, M., between said bait-box and the chamber. B., ever-stop. N., bar, P., lever, S., rod, T., crank-arms, I., crank-absft, H., spring, J., and bait-book and frame, U.V., substantially as described for the purpose pecified.

2d, The wicket door or doors to the communicating passage, C, provided rith a flange piece or strip, or its equivalent, substantially as described for he nurpous specified.

with a flange piece or strip, or its equivalent, substantially as described for the purpose specified.

72.471.—FRUIT DRYER.—M. W. Florer, Bracken County, Ky.

1 claim the box or chest, C, truit holder, B, and pipe, E, when used in connection with the ordinary farmer's or cooking kettle for generating steam, substantially as and for the purpose described.

72.472.—SEED PLANTER.—Jos. K. Frautz, Goodville, Pa.

1 claim, ist, The plow blades, Bg, and covering shares, F2, adjusted by means of the thumb screws, Ds, in the beams, E2, and uprights, C2, secured to the carrying beams, Z, and by the lever, I2, stached to the cross rod, H2, at the rear of the machine, as herein described for the purpose specified.

24, The brush, U, in the hopper, L, adjusted by means of the thumb screw, W, and guide posts, V, as herein described for the purpose specified.

34, The bana lever, Y, and lever, R, in combination with the shart, F, for throwing the pinion, E, in and out of gear with the crown wheel, D, as herein described for the purpose specified.

throwing the plaion, E, in and out of great with the crown wheel, D, as herein described for the purpose specified.

72,473.—RAIL FENCE.—Ambrose Frayer, Ripley, Ohio.
I claim the herein described fence, when constructed and arranged in the manner substantially as described, consisting of the side braces, F, so arranged that the yoke, E, embraces their up-ur sade, thereby holding them securely in connection with the posts, C, at the same time binding said post together, whereby the rails are supported and kept in position between said post and upon the sills, B.

72,474.—APPARATUS FOR VENTILATING MILLSTONES,—Willston E, Fuller, Modena, III.

13,442.—APPARATUS FOR VENTILATING MILLSTONES.— Williston K. Fuller, Modena, Ill.
I claim the millstone, G. provided with the scroll wing, A., and tube, B. so
arranged that the tube will pass down the eve of the stone a certain portion
of its length, and through the corner at an angle, so as to open on the face of
the stone a short distance from the eye, constructed and operating substantially as herem indicated.

72,475.—Churn.—J. C. Gaston, Cincinnati, Ohio, I claim the construction and arrangement of two perforated dasher heads, coursed one above the other to the dasher handle, and having an equal numer of perforations, and so placed that the perforations in one head shall be proste the solid part of the other, substantially as and for the purpose de-

has, in combination with the above, providing the cover with the air tube, with a semi-cylindrical shaped cap, c, as and for the purpose set forth.

72,476.—TIRE BENDING AND SHRINKING MACHINE.—Jacob Gettemy, Donegal, Pa.
1 clsim, ist, The device for operating the rollers, E. S., so that they may be moved in the desired direction, said device consisting of the crain; shaft, C, in combination with the connecting rods, es, sidiling frames, D, D, and grooves

ides, f, in frame, A, all made and operating substantially se herein shown or guides, f, in frame, A, all made and operating substantiant we serve show and described.

2d. The device set forth in the foregoing claim, in combination with the indicator, i, on shaft, C, the same being made as set forth.

3d. The indicating device, i, in combination with the roller, B, arranged as a forth.

3d. The indicating device, I, in combination with the roller, B, arranged as ext forth.

4th, The roller, B, when corrugated as set forth, in combination with the rollers, E, the latter traveling on inclined planes, substantially as and for the purpose herein shown and described.

72.477.—GATE.—Robert Gridley, Lagrange, N. Y.

1 claim, 1st, A self closing gate, when arranged so that it is brought through the slotted post, B, and into an inclined position, when opened, substantially as herein shown and described got horizontal bare, b, plvoted to pickets, c, and when prints, g, and the handles, ff', all made and operating substantially as herein shown and described.

3d, The shove in combination with the locking levers, H H, connected by a rod, I, substantially as herein shown and described.

72.478.—MACHINE FOR FOLDING SHEET METAL.—Leroy A. Glesson, Southington, Conn.

Glesson, Southington, Conn.

Glesson, Southington, Conn.

I claim, 1st, The combination of the folding bars, F G, disk, c c', frame, D, rod, H, carn, I, and arms, K, operating as described, for the pairpose of making a round or sharp bend, substantially as berein set forth.

2d, The combination of the folding bar, F, hinged arms, K, hinged frame, D, upright rods, e, secured to the plate, F, rod, H, came, I, and arm, c, all operating as described for the purpose of clamping the metal to be folded, as and for the purpose specified.

the purpose specified.

-COTTON CULTIVATOR.—E. H. Goelet and E. B. Goelet and E. Goelet and

72,479.—COTTON CULTIVATOR.—E. H. Goelet and E. B. Goelet, Goldsborough, Tenn.
We claim, ist. The arrangement of vibrating knives or hoes, g.g., between
the scrapers, H. H., and the sliding plows, J.J. in a two wheel machine, substantially as and for the purposes described.

3d. The right and left hand knives, g.g., formed on or applied to sbanks, e.g.,
secured together and applied to a rock shaft, G., substantially as described.

72,480.—STEREOSCOPE.—OSCAT Georke, Brooklyn, N. Y.
I claim, ist, The picture holder, C., constructed as described, consisting of
the end wires, c', in the bars, c3, their upper ends bean to form a horizontal
toop for the ends of the pictures, and the central pin, ct, as herein shown and
described.

described, construction of the octagonal rollers, D. E. endhas belt, B. picture holder, C. sliding bar, F. guid.s. G. cord, H. and pin, I. all arranged and operating as herein described for the purpose specified.

3d. The combination of the set or adjusting serews, I. cords, H. sliding bars, F. and flanges or keepers, G. with each other, and with the shaft or cylinder, E. and box, A. substantially as herein shown and described, and for the purpose set forth.

72.481.—Filter.—Geo. W. W. Goodwyn, New Orleans, La. Iclaim the combination of the exterior vessel, A, with the inner vessel, C.

12,491.—FILTER.—GGO. W. W. GOOGWYN, New Cricking, La. I claim the combination of the exterior vessel, A, with the inner vessel, C, provided at its lower end with a filter chamber, E, all constructed and arranged substantially as and for the purpose set fortia.

72,482.—CAR COUPLING.—Robert Goole, Abingdon, Ill. I claim, 1st. The bar, g, upon the shaft, F, provided with the slotted arm, t, strugg over the head of the setsory. J, in the inner end of the pivrosed hook, D, in combination with the lever, K, and chain, I, as herein described, for the purposes specified.

D, in communication what two lever, a, and take, it is a consisting of the parposes specified.

2d, The arm, h, in combination with the hooks, d, and shaft, F, as herein described for the purpose specified.

2d, The car coupling constructed as described, consisting of the hooks, D, and links, C, upon each side of the first heads, B, rock shafts, F, bar, g, arms, h, slotted arm, i, set screw, J, chain, i, and lever, K, all constructed and arranged to operate as herein shown and described.

72,483.—SKATE.—Ferdinand Haase and Wm. Rost, Proviso,

72,483.—Skate.—Ferdinand Haase and Wm. 160st, Froviso, William a skate frame provided with the laterily adjustable toe clamps, the adjustable sliding clip, 6, made to embrace the shank. I, and the heel clip, H, operated by the screw, B, all arranged to operate substantially as shown and described.

72,484.—COMBINED HORSE AND WAGON BRAKE.—G. Haberland, Poutiac, Ill.
Iclaim, 1st, A horse brake consisting of the front-leg straps, G G, hind-leg straps, I, I, and cords or lines, J and J', the latter fitted over pulleys, I, and all combined with the drum, D, arranged in the front part of the wagon, substantially as herein shown and described.

24, 1% above, in combination with the wagon brake, ff, connected with the drum D, arranged in the front part of the wagon, substantially as herein shown and described.

72,485.—HORSESHOE.—Fatrick Hanley, New York city.

I claim the bevel, s, in the horseshoe, the plaies, B G, and their connections, substantially as and for the purposes described and set forth.

72,486.—NUT FASTENING.—William Harris, Rush Run, Ohio. I claim a nut which is provided with a perforated locking eam, substantially in a described.

I claim a nut which is provided with a perforated locking cam, australially in as described.

72, 487.—TAPPING NUTE.—H. C. Hart and J. R. Blakeslee (assignors to Hubert C. Hart and Luther T. Moses), Uniouville, Coun. We claim, ist, The combination of the shaft, c, cam, h, lever, h', and drin spindle, i, substantially as described.

24. Also, the employment of the tooth wheel, k, rack, k', nut box, m, conductor, m', belts, as, to introduce the nuts to the action of the tapping tool, substantially as and for the purpose described. and operating albatantially as set forth.

34. Also, the belt shifter, g, constructed substantially as described, in combination with the drill and drill spindle, all arranged and operating substantially as set forth.

4th, Also, the improved machine for tapping muts, constructed and operating substanting aphstantially as set forth. ing substantially as set forth.
72,488.—METHOD OF LINING HOSE.—Howard Hartley, Pitts-

burgh, Fa. burgh, Fa. burgh, School of inserting and attaching spiral metablic liming to hose.

72,489.—STEAM GENERATOR.—J. M. Harvey, Buchanan, Va. Calaim he construction and arrangement of the within-described steam.

I claim the construction and arrangement of the within-described steam generator, in a manner substantially as shown.

72,490.—Machine for Therading Screws.— Harvey J. Harwood and William H. Mickle (assignors to Harvey J. Harwood and John F. Seymour), Utica, N. Y. We claim, is, The combination of the reciprocating dies, A and B, and guides, k I and m. John F. Seymour), Utica, N. Y.

You claim, is', The combination of the reciprocating dies, A and B, and guides, k I and m.

2d, Also, that of the sorrew of increased pitch, as described, S. Also, that of the sorrew of increased pitch, as described, S. Also, that of the sorrew of increased pitch, as described, S. Also, that of the sorrew of increased pitch, as described, S. Also, that can be point of the screw.

3d, Also, the channels, v v v, in the dies. A and B, that extend beyond the part of the die that forms the point of the screw.

3th, Also, the golden arrangement of the parts whereby the dies are embled to operate upon two screws during each revolution of the crank, E. Sth, Also, the conting and closing of the guides, k I and m, in the manner and by means substantially as described.

3th, Also, the golden, k and I, and their arms. o and n, arranged in the manner and for the purpose described.

72, 491—TOOL FOR STARPENING HORSESHOE CALKS.—Nathan Hays, William Duncau, and E. B. Bowen, Vinton, Iowa.

We claim the combination of the lever, A, with the jaw, a, the pivoted dog, B, the forked lever, C, and the rotary cutter, d, constructed, arranged, and operating substantially as and for the purpose described,

72, 492.—MACHINE FOR PUNCHING HUBBER INNER SOLES.—

Edwin A Hill, Quincy, Mass.

72,492.—BACHERE FUR Mass.
Edwin A Hill, Quincy, Mass.
I claim the machine, substantially as described, as composed of the die plate, C, the punches, c, the clearer. F. the centralizers, i, the depressers, m, and their serows, o, constructed, arranged, and combined together, and with a frame, A, and mechanism for giving vertical motions to the punches, can-

ralizers, carrier, and depressers, as specified.

2, 493, — Door Plate and Letter Box.—Edward A. Hopgins, Minnapolis, Minn.

1 siam, let, The construction of an ordinary metallic and glass door plate
rith a double frame, A and B, and the arrangement of B within A, so as to
orm a letter-box lid.

4 The compliantion, with B, of the apring, C, and harmore, D, for the purorns a futer-box lid.

7 The combination, with B, of the spring, C, and hammer, D, for the pur

9 poec of striking the bell, E, as the lid falls, all substantially as and for the
purpose set forth.

-Combined Time and Percussion Fuse for Explo arys Euglis.—B. B. Hotchkins, New York city.

f claim, ist, The employment, in an explosive projectile, of a quantity of utic-burning material, it, permanently attached and protruded beyond the contact of flame on all sides, in combination with the surrounding borman, C, substantially as and for the purpose rein described.

the described.

At The magazine, G, of quick powder, arranged in direct contact with the fat, The magazine, G, of quick powder, arranged in direct contact with the borman and adapted to be ignited at the proper time thereby and to increase the force with which fame is thrown into the shell, substantially in the man ner herein described.

At the cavity magazine, G, arranged as represented, the use of powder in one or more large grains, in combination with the contraction, g, smaller than eadi grains, and arranged to perate therewith and retain the powder but discharge the fame therefrom, substantially in the manner and for the property of the powder of the powder and the powder of than ead grains, and arranged to open substantially in but discharge the fame, therefrom, substantially in purpose herein set forth. 72,495.—GATE.—H. Hunt, Delayan, Wis.

f claim the arrangement and combination of pulleys, J K, attached to shacked, H, with cords, n and m m, used for operating gate, L, on planes, F E, the inter having a curvo, Z, substantially as set forth.

72,496.—WELL REFRIGERATOR.—Daniel Hyre, Union, Ohio m the combination and arrangement, in a well refrigerator, of the parts, viz. platform, B, with doors, C, frame, A, cupboard, D, rolley, B, K and J, erank, M, cords, n, pawl, n, and friction block, F, subly as described and for the purpose set forth.

72.497.—MACHINE FOR BORING POSTHOLES.—Win. R. Hes,
West Rushville, Ohio.
1 claim, 1st. The bracket, D, suspended on the journals, 1f, in combination
with the grat wheels, substantially as described.
2d. The hinged valves or wings, G', in combination with the pour and described.

72,498.—Saw MILL.—Wm. Inman, Middletown, N. Y I claim the securing of jig or muley saws to their slides by means of clamps, 6, composed each of a yoke or frame, with an eccentric fitted therein, and parameters of the saw slides, substantially as shown and described.

72.499.—Door Lock.—Henry Jackson, New York city.
I claim, ist. The boit, B. somposed of the two parts, a b, the former, a, having the tumblers, D, attached, and the later, b, provided with the pin, J, to act against the tumblers in order to force them back, and with them the bolt, substantially as shown and described.

2d, The notices at edges of the tumblers, b, against which the pin, J, bears, to order to lock the tumbler after their sibts, I, have been adjusted in line with the stump, ', substantially as shown and described.

3d, The expanding stump; O, in combination with the slide, b, of the bolt, provided with the slot, K, for compressing the stump in order that the slots, I, may receive it, substantially as set kerth.

The dropping spout, N, and bar or plate, M, constructed as described, in combination with each other and with the bent lever, L, substantially as and for the purpose herein set forth.

4th, The sliding frame, B, and adjustable bars, T, in combination with the slide, P, hopper, O, and double incline, m', upon the bar, M, substantially as herein shown and described, and for the purpose set forth.

5th. The combination of the arms, S, with the shi, ling frame, B, and with the double incline, m', formed upon the bar, M, substantially as herein shown and described, and for the purpose set forth.

6th. The combination of the sorting, W, with the dropping spout, N, substantially as herein shown and described and for the purpose set forth.

7th, The combination of the sorting, W, with the dropping spouts, N, substantially as herein shown and described, and for the purpose set forth.

N, substantially as herein shown and described, and for the purpose f

stantially as described.

72,508.—HAND TRUCK FOR MOVING BARRELS, ETC.—T. W.
Kennedy (assignor to himself and Thatcher Stekerson), Avon, ill.
Lishin the bean lever handles, dd, and the hooks, h b.in combination with
the second surfaceted and operating substantially as and for the purpose
the second described in the second success the second second success the second secon

the truck, A. constructed and operating substantially as and for the purpose herrin described.

72,504.—FARM FENCE.—H. A. Kephart, Fletcher, Ohio.

I claim the bars or buttons, c, pivoted to the stakes, B, and applied to the pannels, A, in the manner substantially as shown and described.

72,505.—BUNG CUTTER.—Josiah Kirby, Cincinnati, Ohio.

I claim, 1st, The chisel or cutter, D, with cylindrical cavity, in combination with the plunger, c, and feeding bar, i, constructed and arranged substantially as described, for the purpose of cutting bung blanks from separate aquare blocks of wood.

1d, The combination of feeding slide bar, i, seed box, C, guides, c o, and spring o', for feeding successively one of a series or pile of bung blocks forward in exact line with the cutting edge of the chisel of a bung machine, operating substantially as described.

3d, the outter, D, feeding slide bar, i, and plunger, e, so arranged relative blocks or blanks in line with its cutting edge, and that, at each sirely to each other, as that the cutter or chisel shall, when cutting, have at least two blocks or blanks in line with its cutting edge, and that, at each sirely and partly cut a second blank, instead of cutting single blank at each stroke, at beautifully as and for the purpose bereinbefored in such as the shall when a continuous conti

parts of the machine.

72,506.—Candle Holder.—Chas. Kirchhof, Newark, N. J. 72,000.—CANDLE HOLDER.—Chas. Kirchio, Now are At the rod, but it claim, as a new article of manufacture, the hook, a b, it combination with rod, d, ball, f, and holder, c, or any equivalent, when constructed and arranged in the manner described, and for the purpose specified. 72,507.—STAIRS.—John Koch, Brookline, Mass.

72,508.—SYRINGE VALVE.—Nathan Lawrence, Taunton, Mass.

72,508.—SYRINGE VALVE.—Nathan Lawrence, Taunton, Mass.

I claim the syringe valve, B, when placed within the metallic cylinder, A from the strength of the cylinder, A from falling out by means of transverse rod, B, or projections, a, as here in shown and described.

72,509 — CARD-GRINDING CYLINDER.—J. O. Lewis, Worces

72,009 — CARD-THIRDIES CILLADAR.

I claim making the rim or metal part, B, with a series of teeth, a, substantially as shown and described.

72,510.—HEAD BLOCK.—M. C. Lewis, Glasgow, Mo. I claim the double hand levers, a a', coanceted separately with the head blocks, B B', by the rock, d'd', coeracting in such a manner that, when the levers are connected together, both head blocks are moved simultaneously, and, when disconnected, each lever moves a different head block, as herein described, for the parpose specified.

Both Rock Bo

I claim the double head, d., operating in such a manufacture blocks, B., by the rods, d., operating in such a manufacture property of the such as a berein described, for the purpose specified.

72,511.—ROAD SCRAPER.—L. W. T. Lodge, Petersburg, Ky. I claim the arrangement of the scraper, D, hinged to the broad heet plate, a, the double catch, b, pivoted to the stock, A, and held by the soring, c, and the side springs, d. pivoted to the beam, B, and the upper corners of the scraper, all combined and operating as herein described.

72,512.—MACHINE FOR ROLLING CLEVIS BLANKE.—Michael Loughran, Pittsburg, Fa.

1 claim one or more grooves, c, in the periphery of one of a pair of cylindrical rolls, with one or more actions or depressions, i, in the bottom of each such groove, all of the form substantially as described, in combination with the notched or mortised guides, n, for the purposes above set forth.

73,513.—APPARATUS FOR DIGGING PEAT.—James B. Lyons, Litchfield, Cons.

72,513.—APPARATUS FOR DIGGING FEAT.—James D. Lyone, Litchfield, Cons.
I claim, 1st, The clasping fork or scoop, II, as constructed, for digging and elevating peat from the bed.
2d. Also, the boom, D. supported on a truck, d, and circular rail, E, for the purpose of raising peat and delivering it, so as to be easily removed for use.
2d. Also, the peat-digging apparatus, as attached to the vertical chaft, in combination with the boom, derrick, rope, or chain, pulleys and windlass, operating substantially as berein specified.
4th, Also, the arrangement and combination of the eccentric cam, k, rod, n, cell crank, m, and handle, I, for controlling the digging and delivering apparatus, substantially as and ior the purposes set forth.
72,514.—HARNESS PAD.—John Maclure, Newark, N. J.
I claim, ist, The main plate, A, constructed substantially as shown and described, for the purposes set forth.

A, The sct p-jate, B, in combination with the plate, A, substantially as and for the purposes described to the substant of the purposes.

for the purposes described.

Sd. The lags, b and c, on the sub-plate, B, substantially as and for the purpose described.

Ath, The double-inclined planes, i, the slot holes and grooves, J, on the main plate, a, substantially as described and for the jurposes set forth.

72,515.—MACHINE FOR PRODUCING STERREDTYPE MOLD.—John Mac Mair, New Orleans, La.

I claim, 1st, A series of disks, B, provided with two sets of types, and arranged with cords, d, pins. e, and weights, Q, to operate in connection with an index plate, E, substantially in the manufer as, and for the purpose set forth.

an index plate, K, substantially in the manner as an index plate, K, substantially in the manner as an index plate, K, substantially in the manner as an index plate, K, and correcting the types, J, composing a word or sentence, and clamping the disks, B, as set forth.

3d, Releasing the pins, e, from the perforations in the plate, K, by swinging down said plate, or by any equivalent means, as herein shown and described.

72,516.—WINDOW-SASH LOCK.—Nathan F. Mathewson, Barringon, assignor to himself and Wm, C, Green, Providence, R. I. I claim, ist, The combination of the toolhed sector and gear, provided with a key socket, or its equivalent, with the radial swing-bolt, applied to a case, as specified.

with a key social case, as specified.

2d, Also, the combination and arrangement of the spring-dog, g, with the adulal wing-bolt, its toothed sector, and the operative gear thereof, as pro-ided with a key socket, or its equivalent, as set forth.

2d, Also, the arrangement of the radial spring-bolt, and its operative mechanism and reserving socket, with the two bars, i k, of the two sashes, in

manner as specified,
78,517.—BANJO.—Jerome Mayberger, New York city.
Iclaim, 1st, The annular drum, B, when provided with a perforated sound
board, a, substantially as and for the purpose set forth.
2d, The head, C, when constructed as desgribed, and when provided with
supports, g, in combination with the annular drum, B, the same having a
perforated sound board, as set forth.
72,518.—Post DRIVER.—Silas McCullough and Alexander
Robins Buffalo, Ob.

Robins, Buffalo, Oh o. We claim, its. A post or pile driver, constructed with longitudinal beams A A, resting on rockers, C C, which act in conjunction with the alosts, d, all constructed and combined substantially as described, and for the purposes act forth.

act forth,

act forth,

post or pile driver thus constructed, the hinged posts, B. H. provided with heace, D.D. constructed and operated as described, and for the purposes est forth.

act in like combination, the adjustable inclines, hh, as and for the purposes.

To be set torth.

72,519.—RAILROAD SWITCH.—S. C. Megill, Newark, N. J.

I claim the construction and arrangement of the bent lever, E. pivoted to
the tie, F. its inner arm, s. connected to the bent lever, H. by the jointed rod,
g. its outer arm, c. connected to the angular beser, H. by the bent rod, L. and
appearating as described, for the purpose specified.

72,520.—Hot Air Furnace.—Geo. F. Merklee, N. Y. city, I claim, ist, The combination, in an air-beating furnace, of the plate, G. constructed substantially as described, with the air passages, I 1 I 1 I, and annular flue, b, for the purpose as est forth.

2d, The combination, in an air-beating furnace, of the dome, c, air pussages, I I I I I, and annular flue, b, with the eylinder, J J, or its equivalent, substantially as and for the purpose set forth.

72,521.—GRAVER.—Ralph S. Mershon, Zanesville, O. —Iclaim, ist, A graver, so connected to its handle or holder that its catting edge can be adjusted substantially as and for the purpose described.

3d. Also, a graver having a short base, a, and continuous face-line, b, substantially as and for the purposes specified.

72,500.—BLEACHING AND SCOURING HEMP, FLAX, AND OTHER FIRERS.—Léco Jaromon, Lille, France.

1 claim, i.t., The apparatus represented in ag. 1, for securing the hanks of threads by means of dry steam.

24, The arrangements relating to the whole of the successive cream coloring and bleaching of the threads, as illustrated in figs. 5 and 5.

25, The order for said threads, represented in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, as illustrated in figs. 5 and 5.

25, The order for fact threads, represented in figs. 5 and 5.

25, The order for fact threads, and the other for fact threads, represented at figs. 10 and 11.

25, The order for fact threads, represented in figs. 5 and 5.

26, The order for fact threads, and threads, threads threads, threads, threads threads, threads,

described.

Providing the movable plungers, b b, with levers, e, guides, e, and g pieces a, substantially in the manner and for the purposes described.

The markers, J, applied to adjustable drums, F, in lines with the seed thereof, embatantially as described.

cells thereof, clusteritally as described.

72,525.—BREECH-LOADING FIRE-ARM.—Wm. Morgenstern,
Hartford, Conn., serignor to bimselt and Charles Heroid.

I claim the double acting rotating and awaging breech-piece, d, hung upon
the extractor hinge-piece, e, with the spring, e', arranged and operating substantially as described. stantially as described. 72,527.—RAILROAD TRACK LIFTER.—John Morton, Winches

2,03°.—RAILHOAD TRACK LIFTEH.—John Morton, whichester, ind.
I claim, ist, The combination of the levers, A, for raiting raitroad tracks,
I claim, ist, The combination of the levers, A, for raiting raitroad tracks,
this the chain or cord, C, and the mechanism for actuating the same, subtantially as set forth.
2d, The arrangement of the mechanism for actuating the track-lifting
vers, A, said modulation consisting of the parts, C, D, Z, F, G, and E, sub3d, The combination of the pederal, E, post, L, braces, B, and tracking levers, A, arranged to operate substantially as and for the purpose set
orth.

72,528.—WATCH.—Don J. Mozart, New York city.

Total.

72,528.—WATCH.—Don J. Mozart, New York city.

1 claim, ist, An escapement for watch or other time or other similar movements, in which are combined a cat-out staff and a cut-out scoesire detect, or their respective equivalents, connected together through a trip lever or other suitable device or devices, when both ere constructed and arranged for the purpose described.

2d. A cut-out staff, a cut-out eccept in the suitable level, but has a trip lever, having one or more side arms, with its working faces curved or circular in shape, or any equivalent therefor, respectively, in combination with the escape wheel, or the purpose est forth.

72,529.—VALVE FOR STEAM AND OTHER ENGINERTY.—George Marray (assignor to himself and J. C. Chapman), Cambridgeport, Mass. I claim the hollow expension ping, B, made in two or more parts, with the spring, e, and provided with a direct passage, f, and an additional opening, g, for the estrance of the steam or water when the valve is closed, substantially as and for the purpose described.

25.530.—STEAM GENERATOR.—A. W. Newell, Bradford, Pa. I claim, its, The apertures, F F F, etc., between the sections, for the purpose est forth.

2d. The combination and arrangement of the sections, A. A. etc., the lugs, B, etc., or their equivalents, he steam pipes, C. etc., provided with expansion joints, D., etc., or their equivalents, and the apertures or openings, F F, etc., when constructed substantially as and for the purpose described.

25.531.—STEPS FOR SPINDLES.—G. H. Noble, Lowell, Mass. I claim the soludie, k, with its each, j, recavity holes, i i, and distributing holes, e.e., and case, s., the whole constructed, arranged, and combined substantially as and for the purpose described.

25.532.—SLEEGH.—Harvey D. Palmer and James H. Beard, Leondas, Mich.

Wealam, ist, The employment of the wheels attached to the arms, E F E. and working in the alutical braces. C C C c. on planting in a planting as above, for

72,532.—SLEIGH.—Harvey D. Painer and the same, E E E Leonidas, Mich.

We claim, its, The employment of the wheels attached to the arms, E E E L, and working in the slotted braces, C C C C, substantially as shown, for the purposes and uses expressed.

3d. The actuating lever, K, connecting piece, G, and slotted levers, F F, all as shown for the purposes described.

72,533.—MACHINE FOR REMOVING MOLDED FORMS FROM THE PERSS.—George Patten, Chester, Pa. 1 claim, its, The adjustable palms, P P, in combination with the elides, e e, and vibrating lever plate, D, or their equivalents, automatically operate i to grapp a molded form with the pressure requisits for removal, substantially as est forth.

lest forth.

30, Automatically grasping and releasing molded forms by the action of
e conveying mechanism, substantially as set forth.

80, The combination of the feed-arm with the conveyor and receiver, subantially as set forth.

84, The plate, 7, or its equivalent, constructed and operating substantial-4th, The blatte, T. With the Land of the Division of the Divis

disk. A, constructed and operating state purpose described.

72,555.—Churk.—Thomas Payne, Grand Rapids, Mich.
I claim the oblique besters, H, attached to the rotating shart, C, in the cream receptacle, substantially in the manner at and for the purpose nerein set forth. 72,586.—Gate and Barn Door Fastening.—W. W. Peck,

Casapolis, Mich.

I claim, is, The removable extension handle, F, in combination with the princ latch, D, box, E, and catch, b, substantially as herein described, for he nursoes needled. a principation, b, box. E, and catch, b, submanuary approaches, b, box. E, and catch, b, box. E, when provided with a tongue, c, the spring, d, and the catch, b, the latter being provided with projections, f, and catch, b, in combination with each other, and with the lover, F, all made and operating substantially as herein shown and described.

72,537.—ROTARY STEAM ENGINE.—Rufus D. Pettit, Baldwinsville, N. Y.

I claim the combination of the cylinder, A, exhausts, E K k k, inductions, L L I I, abutments. E E, disk, B, and slidling pistons, F, with actuating steam chambers and conduits, G H B, valves, L and packing rugs, at M', all conductions and conduits, G H B, valves, L and packing rugs, at M', all conductions and conduits, G H B, valves, L and packing rugs, at M', all conductions and conduits, G H B, valves, L and packing rugs, at M', all conductions are not considered as and operating substantially as and for the purpose specific conductions.

Structed, arranged, and operating substantially as and for the purpose specified.

72,538.—CARRIAGE WHEEL.—John Raddin, Lynn, Mass.

I claim, in the construction of carriage wheels making the felly or rise thereof of wrought metal tube, the outer surface of which is flattened and surfaced by a tire, substantially as and for the purposes set torth. Also, in combination with such tubular fully, the disatic sushious, arranged to operate substantially as described.

72,539.—CANE AND THERMOMETER COMBINED.—James L. Beber, Philadelphia, Pa.

1 claim the combination of a thermometer, with a walking cane, substantially as described, for the purpose specified.

72,540.—Horse Hay Fork.—Cullin W. Reed, Chagrin Falls, Ohlo.

Falls, Ohio.

Falls, Ohio.

I claim the tines, B and C, bars, A, latch. D, and cords, E and F, when the same are combined and arranged substantially as described, and for the parameter of the parameter of the combined and arranged substantially as described.

pose set forth. 72,541.—ARTIFICIAL TEETH.—William Reynolds, Colum-

72,541.—ARTHECIAL TEETH.—William Reynolds, Columbia, S. C.
I claim, 1st, The bar, a, tormed of gold or other entable metal, apapted for the prevention of f actures in the anterior and lateral portions of the plates, and as a attachment for the teeth substantially as described.

2. The thinned extension, b, of the backing, of form and mode of adaptation to the bar, as herein described and shown.

72,542.—LANTERN.—Joseph H. Richardson, Philadelphia, Pa.
I claim, 1st, The perforated cap, C, in combination with a lamp, F, fitted within or upon the base, A, of a lantern, substantially as and for the purpose specified.

filled.

Also, The double walls, a a, when filled in with suitable material to form ir-tight joint, in combination with the globe or chimner, B, and ring, c, reling the base of the same, substantially as herein shown and described. Also, the tube, G, and plate, e, in combination with globe, B, and an air joint around the lamp. F, substantially as and for the purpose set forth.

tight joint around the lamp, F, substantially as and for the purpose set forth.

79,548.—Weather Strip.—Horace A. Robinson, Cleveland, Ohio.
Lalam the combination of the strips, B and C, united by the rubber strip, c, running the entire length of the strips, B and C, the spring, f, and the ruber strip, g, all constructed in the manner as and for the purpose set forth.

72,544.—EARTH CONVEYER.—Niram Russell, Harrison, O, I claim, ist, The arrangement of the following frame, A, 4, B B, O C, understord, I, and pivoted flap, f as herein described, and for the purposes set forth.

3d, in combination with the above parts, the adinatable has a special content of the strips.

3d, In combination with the above parts, the adjustable har, H. and adjustable earrier, E. as and for the purpose set forth.
73,545.—GAS BURNER.—John Scholl, London, England.
I claim the application and use to and in gas burners, substantially as here-labefore shown and described, of a narrow and this strip of pintlenum, for the nurpose set forth.

It claim the application and use to and it gos barrers, spoetantally as need the barrers, and described, of a narrow and this strip of pistimum, but the purpose set forth.

72,546.—Phoches of Manufacturing an inisid hat by inserting the colored pattern yarn transversely through the hat body of a different color. Previous to the completion of the feiting, and then feiting the said body, and hishing it without dyeing it, enbeantielly as hereinbefore set forth.

72,547.—MACHIKE FOR BENDING HOOKS.—R. B. Sears, Proyldence, B. I. I claim, i.s. The arrangement of the crank shaft, I, arms, h, shaft, H, cranks, g, shaft, c, and gear whoels, i and j, all male and operating so as to impart a double oscillating motion to the came, G, substantially as est forth.

2d, Making the die or inside former, D, of two parts, substantially as and for the purpose hereit shown and described.

5d, in combination with the above, the dis, D, made in two parts, and the follower, E, all constructed, arranged, and operating substantially as described and represented.

*

72,548.—VALVE STOPPER FOR JARS, BOTTLES, ETC.—Samuel

F. Shadbolt, Huntington, N.T.

F. Shadbolt, Lima, Ind.

I claim the bar, or rail, F. pivoted at one end to a gate, and at the other hung to a gate post, A, in combination with the windless drum, I, hung to be gate, and connected to said rail, F. by the cord, II, substantially as above and described.

-Machine for Making Horse Shoe Nails.—Ad-

72,550.—Machine for Making Horse Shoe Nails.—Adrian Shaw, Westford, Mass.

I claim the side hammers, N., connecting rod, P., and alide bars, Q. in combination with each other, and with the came, M. levers, R. I., and springs, T., substantially as and for the purpose specified.

72,551.—Sawing Machine for Barrel Hoops.—George H. Shearer, Bay City, Mich.

I claim the metallic frame, F., constructed as described, provided with the journal boxes, a b., one above its other, bolding the arbor, G., above or below the board to be sawed, and also provided with the open bearings upon each side of the arbor. G, for the removable shafts, I. K., all arranged as described for the purpose specified. for the purpose specified.
72,552.—POTATO-DIGGER.—Thomas W. Shepard, Henne-

73,552.—POTATO-DIGGER.—TRUMBS W. Employed, but, ill. I claim, 1st, The plow, E, when constructed with the horizontal sharp edge, the convex upper surface, the bars, e. e. e. and the supporting rods, F. f. the the main portion of the plow consisting of a steel plate of the crescent form shown and described, when all the parts of said plow are constructed, combined and arranged substantially as and for the purpose set forth.

2d, The device, consisting of the arms, N. N. teeth, n. n. cross bar, O, or its equivalent, and chain, F. for the purposes above set forth.

3d, The method of regulating and adjusting the plow, E, as above described, 3d, the method of regulating and adjusting the plow, E, as above described, which is the control of the control

EX. EYO.—Thomas Skinner, Pittaburg, Pa.
I claim the herein-described method of preparing the design upon the article to be operated or. preparatory to the etching process, by the means of transters, substantially as et forth.
72,554.—STEAM SAFETY VALVE.—James Slater, Philadel-

72,554.—STEAM SAFETY VALVE.—Gaines States, phia, Pa.
phia, Pa.
I claim a valve or indicator, constructed and arranged in its parts, substantially as and for the purpose described.
72,555.—AXLE FOR WAGONS.—Alfred E. Smith, Bronx-ville, N. Y.
I claim the D-shaped washer, J, in combination with the screw cap, H, and disphragm, F, made and operating substantially as hereinbefore set forth.
72,556.—SEED-PLANTER AND CULTIVATOR.—Milo R. Snod-

72,556.—SEED-FLANTER AND CULTIVATOR.—Milo R. Snodgrass, Jamestown, Obio.

1 claim, i.s., The grovers, c. in the upper surface of the slide, F. in combination with the holes, b, in said slide, and the holes, a, in the plate, E, all ar2d, The chambers, d, on the plates, to receive the cut-off brashes, e, in combination with the holes, b, in slide, F, and the holes, a, in plate, E, for the
purpose specified.

3d, The valves, J, in the spouts I, when operated from the slide, F, substanti-ly in the manner as and for the burpose set forth.

4th, The adjustable beams, M', arranged so as to be operated through the
m-lymo of the crank shait, P, and lever, R, when said parts are used in consection with the upright, I, provined with catches or projections, k k, all

5th, The adjustable beams, M' M', applied to the frame, A, and operated
through the medium of the treadle, U, and pendent rods, u u, all arranged
substantially as and for the purpose specified.

6th, The adjustable beaxies, V V, of the wheels, B B, arranged substantially
as and for the purpose specified.

72,557.—BULLDING BLOCK.—J. S. Stewart, Homer, N. Y.

I claim a building block constructed with corrugated side and vertical and

the purpose specified.

Building Block.—J. S. Stewart, Homer, N. Y.

72,557.—BUILDING BLOCK.—J. S. Stewart, Homer, N. Y. I. claim a building block constructed with corrupated side and vertical and horizontal openings, substantially as and for the purpose described.
72,558.—INSTRUMENT FOR DYEING THE HAIR.—Lucius S. Stimson (sasignor to bimself and Jerome B. Melvin), Lowell, Mass. I claim coating or covering the testh of a comb, or the bristles or the wires of a bristle or a wire brush, with coloring matter as described, that the hair may be dyed or permanently colored by using said prepared comb or brush, substantially as specified.
72,559.—Gas Fixture.—William Mont Storm, N. Y. city. T claim the sliding "hood" and rod, c, in combination with the burner, and operating simultaneously with the cock, the whole acting substantially in the manner and for the purposes set forthe.
72,560.—Cultivator.—Charles E. Storrs, William E. Keyes, and David W. Jones, Grandville, Mich.

(3,000).—CULTIVATUS.—CHARLES E. STOLIN, IT MINISTER A AND SO, and David W. Jones, Grandville, Mich., We claim, 1st, The scoop-shaped plows, D, for cultivators, substantially as and for the purpose shown and to the purpose shown and to the cutting edge, C, substantially as and for the purpose shown and colten of cutting edge, C, substantially as and for the purpose shown and

eolier or cutting edge, C', substantially as and average described.

3d. The plows, D, in combination with the V-shaped frame, substantially an and for tite purposes shown and described.

72.551.—MACHINE FOR FOLDING TINNED PLATES.—O. W.

72,561.—MACHINE FOR FOLDING TINNED PLATES.—O. W. Stow. Plantsville, Gonn.

I claim, i.s., The slide, L., in combination with the folding bar, D., cams, E., bed, F., and adjustable bearings, C., operating as described, whereby the bar, the combination of the proper specific period of the proper specified.

2d. The cams, J. E., pin, K. and folding bur, D., in combination with the arms I, slide, L., bed, F., and fixed bearing, H., all operating as described, whereby the metal plate, G.r., sheld securely in position while being folded, substantially as described, for the purpose specified.

72,562.—FOLDING TABLE.—Joseph Sutter, New York city. I claim a table in which the bottoms of the X-folding legs are sufficiently spread to support the table when folded, and the upper ends of said legs are connected to the bed of the table in the manner specified.

Also, a foldieg table with the marble top cemented into a recess in the wooden bed, as and for the purposes specified.

72,563.—MODE OF REMOVING BURRS FROM WOOL.—William Sykes, Newton Lower Fals, Mass.

Sykes, Newton Lower Falls, Mass.

I claim the immediate dyeing of the wool after the same is taken from the induced outling, and either previous to or after the drying of the wool, substantially as set forth.

RIDSTANTIALLY AS SECTION AS A CONTROLLING THE MOTION OF TRAVELING WIDE IN PAPER MACHINER, ETC.—F. Thiry, Huy, Belgium, assignot to Warner Miller, Herkimer, N. Y.

I claim the rule, D, provided with the plate, F F, and connected to the vers, E F; in connection with the screw, K, double toothed wheel, J, inved lever, I, tever, H, and crank, G, on one of the journals of the connecting roller, A, all arranged to operate in the manner substantially as and or the purpose herein set forth. ducing Fourt, and art set forth. for the purpose herein set forth. 72,565.—Hose Coupling.—Nathan Thompson, Brooklyn, N. Y.

Telaim the combination of a loading piece provided upon the member of a coupling, with a guard or protector attached to or making part of the other member thereof, the combination being substantially as described.

72,566.—Pipiz Coupling.—Nathan Thompson Brooklyn, N. Y. I claim in combination with two flanges making part of a coupling, ears, and a locking piece which can be disconnected from and connected to the said lags or ears, the construction of the parts being substantially such as specified.

asid luga or ears, the construction of the parts being substantially such as split in the combination with two flanges making part of a coupling, and a locking piece capable of removal and replacement, a socket attached too of the flanges and substantially surrounding the other, as described, the combination being substantially surrounding the other, as described, the combination being substantially surrounding the other, as described, the combination being substantially surrounding the other, as described, the combination being substantially surrounding the other, as described, the combination of the lever, 6, or its substantial equivalent, with the slide, C, connecting bar, D, and thes, B substantial as herein shown and described and for the purpose set forth.

72,568.—PLOW.—William Titus, Brooklyn, N. Y.

I claim, 1st, The malicable from mold board, b, and share, S, in one piece.

24. Also the grooves, 1, 2, 5, 4, in the adjustable colter, c, and the adjustable grower, 1, 2, 5, 4, in the adjustable colter, c, and the adjustable grower, 1, 2, 5, 4, in the adjustable colter, C, and the movable grower, 1, 2, 5, 4, in the adjustable colter, C, and the movable control of them, consisting of the bars, B B, the ferrules, C C, and the movable control of them, consisting of the bars, B B, the ferrules, C C, and the movable control of the movable control of arresting the motion of the rollers by means of the movable control of arresting the motion of the rollers by means of the movable control of arresting the motion of the rollers by means of the movable control of a growing the copy to doler under under different conditions, as set forth.

21, Also the method of arresting the motion of the rollers by means of the movable control of a growing the copy to doler under under different conditions, as set forth.

tions, as set forth.

72,570.—REFLECTOR.—Wm. Ulrich (assignor to himself, C.
M. Theberath, and J. H. Theberath), Newark, N. J.

1. Statistic, 1st. The revolving and folding reflector made and operating substantially as bereich shown and described.

1. Statistic are reflector, A, to a bar. B, which carries a ring, sleeve, or clamp, 1st of of which it can be secured to a burner or lamp, substantially and fourth of which it can be secured to a burner or lamp, substantially and fourth of which it can be secured to a burner or lamp, substantially and fourth of which it can be secured to a burner or lamp, substantially and fourth of the secured to a burner or lamp, substantially and fourth or substantially and fourth or substantially and fourth or substantially and fourth or substantially and substantially and substantially and substantially as a substantial subst by means of which it can be secured to a punits, by means of which it can be secured t

2d. Providing a revolving the holding research tailit as set forth.

72,571.—Cooking Stove.—Chas. Van de Mark, Phelps, N. Y.
I claim the partition plate, G, between the fire chamber, A, and heating chamber, B, provided, with one or more upper and one or more under valves the and it, substantially as and for the purpose herein specified.

Also the holler-hole plate or plates, D, and inclosing side plate or plates, E, arranged in combination with partition valves, th, so that the heat may be directed against the bottom and around the sides thereof, substantially as and for the purposes herein specified.

-BERHIVE .- A. C. Varela, Washington, D. C. I claim, ist. The arrangement of the two similar cubic boxes, A and B, main isseried partif into the other in a direction parallel to the diagonals of a tube, and suspended in such manner that only one of their corners points pward, substantially in the manner shown and set forth.

Za. The arrangement of a weather-proof cap, do f metal or any other suitable material, to cover the aperture, e, that admits the bees into the upper or longly box, as shown and described.

honey box, as shown and described.

72,573, — MACHINE FOR MAKING PEAT FUEL.—Gustavus Wissenborn, New York city.

1 claim, ist. The construction of the frames of the machine solid or in two parts, so as to foin them at or about the center of the shaft, and cast or bott the lower brains. A2 A2, to the bed plate, and to make the upper frames, A A, and lower frames. A2 A2 of wrough tiron, or make the upper alone or wrought iron, substantially the same as described. purposes described.

72,591.—Bracing the Sounding Boards of Guitars.—Jos.

2d. Also the surrounding steam, hot air, or vacuum chambers, V V, of the pressing cylinder. As, to use one as a hot air chamber, and the other so a vacuum chamber, or both as a vacuum or steam chamber for oily or water vapors, in combination or separately with the perforated pressing cylinders, substantially the same as herein set forth.

3d. Also the combination of one, two, or more receivers, A12, with the horizontal freders, E3 E3, and vacuum and feeding chambers, A12 A19 and A3 A3, the same as herein described.

4th, Also the direct application of an escentric, with or without a loose riag on its circumference, acting directly, or with an intermediate movable of the control of the co

described.
72,575.—Caster.—Joseph White, Providence, R. I.
I claim as a new article of manufacture a furniture caster consisting of the
grooved plates, B C, spindle, A, balls, a, arms, a', wheel, w, and aut, n, all
constructed, arranged, and operating as and for the purpose described.
72,576.—Churn.—Leman Wiard and Wm. H. Nelson, Spring

72,570.—CHURA.—Telement of the Constructed and operated as described, we claim the two dashers, D C, constructed and operated as described, when the same are in the aforesaid combination, for the purposes set forth. 72,577.—Jack.—Thomas Wiles, Indianapolis, Ind.

I claim the combination of the box, A, with the lever, B, fulerum, C, jack, D, and check, E, applied to a lever jack.

72,578.—MACHINE FOR MAKING PLUG TOBACCO.—J. E. With-

72,578.—MACHINE FOR MAKING PLUG TOBACCO.—J. E. Withers, Toronto, Canada West.

I claim, ist, The finge rollers, E. E. F. revolving in the same direction, in combination with the rollers, G. G. G., in manner substantially as and for the purposes described.

2d. The inclined knife, K., removing the tobacco or other substance from, and in combination with the troughs, F., to the platform, H, or other place of the purposes described.

3d. The flange collers, E. E. F., revolving in the same direction, in combination with the wheel, N, revolving in a transverse direction, substantially as and for the purposes substantially as herein shown and described.

4th, The flange rollers, E. E., revolving in a reverse direction, in manner and tor the purposes substantially as herein shown and described.

72,579.—MANUFACTURE OF IRON AND STEEL.—Henry K. Yerk, Cardiff, Great Britain.

I claim a new mode of decarbonizing cast iron, the making of cast steel by the mixing of particles of cast iron decarbonized with certain proportions of a compound consisting of iron, carbon, and manganese, such compound being found in white cast, iron, known by the name of "Spiegeleisen;" or by the mixing of particles of cast iron, decarbonized, as before described being found in white cast, iron, known by the name of "Spiegeleisen;" or by the mixing of particles of cast iron, decarbonized, as before described bon, in the manner hereinbefore set forth.

72,550.—COAL Strove.—Federal C. Adams and Joseph Peckwith the same case iron not decarbonized, or other cast iron containing car-bon, in the manner hereinbefore set forth. 72,580.—COAL STOVE.—Federal C. Adams and Joseph Peck-

with the same case from no decaroomized, or other case from containing our bon, in the manner hereinbefore set forth.

72,580.—Coal Stove.—Federal C. Adams and Joseph Peckover, Cincinnati, Ohio.

We claim, 1st, The air heating chamber, 6 G, at the base of the stove surrounding the ash box, but sot communicating therewith, with the openings, H, for admitting fresh air, as described.

2d, The pipe or chamber, A, admitting, air, through the fuel to the cap, C, in combination with a concentrating plate, D, at the top of the fire box, substantially as more flues, F F F, for conducting air from the base chamber to a point just below the plate, D, as shown and described.

4th, The adjustable concentrating plate, D D', with the sliding doors, E E', substantially as described of the fire box and the top of the fire basket, substantially as described.

6th, The adjustable concentrating plate, D D', with the sliding doors, E E', substantially as described.

7th, The flue, Q, in combination with the plate or diaphragm, T, substantially as described.

7th, The flue, Q, in combination with the plate or diaphragm, T, substantially as described.

8th, The plate, V, with the openings at their ont and back, substantially as and for the purpose described.

10th, The plate, V, with the opening in front only, in combination with square or circular coal stoves, substantially as described.

10th, The plate, V, with the opening in front only, in combination with square or circular coal stoves, substantially as described.

11th, The plate, V, with the opening with the regulating dampers, Zi Z3, substantially as and for the purpose described.

12,581.—Box For G Agfing ShinGles.—John Wesley Alesubstantially as and for the purpose described.

72,582.—HAND SAW.—John F, Allen, New York city.

1 claim ranging portion of the blade of a band saw to form an angle with the other portion of the blade of said saw, in the manner and for the purpose ubstantially as and for the purpose described.

72,583.—DRYING APPARATUS.—R. N. Allen, Pittsford, Vt.

72,583.—DRYING APPARATUS.—R. N. Allen, Pittsford, Vt. I claim, ist, The cylinder, A, with an annular chamber revolving upon tublar journals so arranged that the said journals and annular chamber shall own an avenue for the passage of waste heat from the flue of the fireplace of the chimner, and at the same time utilize said heat in its transit, substantially as and for the purpose set forth.
2d, The revolving cylinder. A, having an interior chamber, R, and fhollow ournals, B B, in combination with the flue of the boiler and stack, arranged ind operating for the purpose substantially as set forth.

2d, The apron, L, rollers, K, in combination with the cylinder, A, arranged or receive the waste heat through one journal and discharge the same through he other into the chimney or stack, substantially as and for the purpose set both.

forth.

72,584.—CAR AXLE.—Joseph Anthony, Greenbush, N. Y.

Telaim an axle with an enlarged boss and shoulder, substantially as and
for the purpose set forth.

72,585.—APPARATUS FOR WASHING SHEEP SKINS.—E. H.

Ashcroft, Lyrn, Mass.

1 claim an apparatus for washing sheep skins with the wool on, constructed and operated in the manner substantially as shown and described.

72,586.—FLASK FOR FORMING CORES.—Emmet R. Austin, Norwalk, Ct.
I claim the combination of the hinged flask, A and A, with the pipes. E. E., and adjustable steady plus, D. D, all constructed and arranged substantially

and adjustable steady pins, D D, all constructed and adjustable steady pins, D D, all constructed and employed (25,587,—MILLSTONE.—Wm. Bahme, New Media, Pa. Iclaim, i.s. the stone, H, adapted and employed to sink or grind out the central portion of milistones, substantially as and for the purpose set forth. 2d, The shatt, Gg, and driving apparatus, D E f, in the described combitton with the stone, H, for the purpose specified.

3d, The upright shaft, I, constructed as described, in combination with the spindle, C, and stone, H, substantially as and for the purpose specified,

son, the upright shait, I, constructed as described, in combination with the spindle, C, and stone, I, substantially as and for the purpose specified, 72,588.—CHURN.—Henry B. Barber, Scott, N. Y.

I claim the arrangement of the dasher staffs. Cc. and their arms, with the oscillating lever, F. arm, J. shaft, H, with its inclined wheel, I, and the bevel wheels, a and K, substantially as and for the purpose set forth.

72,589.—LANTERN.—Henry Beebe, Hudson, N. J.

I claim, ist, The metallic top, fs. furnished with openings, b' and lined with reticulated material, c, in combination with the glass body, C, substantially as and for the purpose specified.

2d. The base, D, of the body, C, constructed with the annular sheld, E, and openings, a', in combination with the reticulated top plate, b, and the openings, s, of the sides of the burner, substantial, y as and for the purpose specified.

2d. The combination of the metallic perforated top, E', turnished with a rope, a', and dining, c, the glass body, C, and the base, D, formed with openings, a', and chied with the annular shield, E, substantially as and for the purpose specified.

72,590.—MATERIALS FOR PUMP PISTONS, ENGINES, ETC.— Dana Bickford, Boston, Mass.
I claim manufacturing of these different articles in the various wars described and set forth, also the strengthening in the ways and for the different purposes described.

E. Bini, Mount Vernon, N. Y., assignor to James E. Jouett and Charles H. Cushman.

1 claim the braces of the sound board of a guitar, arranged, constructed and connected substantially as described and for the purpose specified.

72,592, —WASHING MACHINE.—W. E. Bird, West Bridgewater, Mass.

72,592.—WASHING MACHINE.—W. E. BIRQ, West Bridgewater, Mass.
I claim, 1st, The combination of the clamps, B, the joint, D, and lever, H, substantially as described, and for the purpose set forth.
2d. The adjustable shield, M, in combination with the handle, R, and lever H, substantially as described and for the purpose set forth.
72,593.—BALANCE.—Ira Bisbee, Richmond, Mo.
I claim, 1st, A scale consisting of the eccentric dick, C, having graduations on both sides, registering with each other, the equipoise, E, firmly secured thereto, and the suspended basins or plates, D, substantially as represented and described.
2d, The disk, C, having graduations on both sides, registering with each other, whereby they can be viewed simultaneously, as represented and described.

and described.

2d. The disk, C, having graduations on both sides, registering with each other, whereby they can be viewed simultaneously, as represented and described.

3d. A scale having the following characteristic, viz., graduations for troy, apothecaries', and avoirdupois weights, for letters and for American and toregn coins, substantially as represented and described.

72,594.—HORSESHOE.—Thomas B. Bishop, Baltimore, Md. I claim the fastening of the lesther, cut in suitable manner, C D, between the two shoes, A B, by means of they straps, by', and ce, substantially in the manner and for the purpose set forth.

72,595.—STEAM GAGE.—Morris Botticher, Newark, N. J. I claim the arrangement of the adjustablescrew, J, with cap, F, of the gage substantially as herein described.

72,596.—MANUFACTURE OF PLOW HANDLES.—T. E. C. Brinley, Louisville, Ky.
I claim the mode of manufacturing the handles of plows, of different lengths and irregular curvatures, by the use of the table, A, gage-block, C, and pins, D, so as to secure the proper alignment of the brace holes, substantially as sot forth.

72,597.—ATTACHING DOORKNOBS TO SPINDLES.—Chas. B. Bristol, New Haven, Conn.
I claim the use of the inclined plane, c, when formed on the corner of the pindle, E, in combination with the binding screw, b, and the neck, C, of the knob, A, and the whole is constructed and made to secure the knob, A, in its desired position without making holes in or putting washers on the spindle and the plow beams, E E, substantially in the mamner and for the purposes set forth.

2d, Also, the arrangement of the draft cord, b, sheaves, a, and pivoted described and cord, and pivoted described and set to the corner of the purposes deforth.

set forth.

2d, Also, the arrangement of the draft cord, b, abeaves, a a, and pivoted anagers, C C, so as to operate substantially as and for the purposes described.

3d, Also, the combination and arrangement of the plow beams, E, rods, d, lever, L, cord, K, rod, J, and lever, I, substantially as and for the purposes pectified.

pecified. the combination of the suspended plow beams, E, rods, U, and evers, W, arranged and operating as and for the purposes shown and est orth.

5th, Also, the peculiar arrengement of and mode of attaching the bow, V, to the orear part of the plow beams, herein shown and specified.

72,599.— HARVESTER RAKE.—Robert D. Brown, Coving-

the rear part of the piece beauss, including the control of the co

72,001.—DOLT FOR SHOTTER.—
Telaim a bolt, having its two separating parts, A A', provided with the sildes, B B', and the sockets, C C', constructed and arranged to operate together substantially as set forth and described for the purpose specified, 72,601.—COATING AND METALLIZING FABRICS.—Rufina Nog-

1.0,001.—UOATING AND METALLIZING FABRICS.—Rufina Noggerath, Paris, France.

1.0 I oliam the new process as described, of hardening, ornamenting, metallizing, or galvanizing fabrics, and other materials, so as to produce, by the various operations herein described, and especially claimed, articles having the appearance, or being really completely transformed into open-work. The same articles, which may be only diversified in column and the same articles, which may be only diversified in column as the same articles, which may be only diversified in column as the same articles, which may be only diversified in column as the same articles, which may be only diversified in column.

metal.

The same articles, which may be only diversified in colors, and left unmetallized, as being especially applicable to various purposes, such as articles of dress, furniture, to hangings, tapestry, to artistic objects, etc.

Likewise, ornamenting, metallizing papers, plaster, and other articles, by the same processes as described.

72,602.—CARRIAGE SEAT. — Edwin Chamberlin, Lansing-burgs, V.

72,602.—CARRIAGE SEAT. — EXIMIT CHARACTER, burg, N. Y.
I claim securing an extra bottom, C, with all the top irons attached thereby, to the seat bottom, B, by means of the double or single bara, e. *, fracticled with the keys, k k, or their equivalents, and operated either from the upper or lower side of the seat, and working into the hook catches, a a, or their equivalents, which hook catches, a control equivalents, which hook catches are permanently attached to either the extra bottom, C, or the bottom, B, and the whole in combination, substantially as and for the purpose set forth and described.

72,603.—HINGE FOR WINDOW SHUTTERS.—Pascal P. Child,

72,003.—HINGE FOR WINDOW SHUTTERS.—FASCAI P. Child, (assignor to S. B. Fox Manufacturing Co.,) St. Louis, Mo. claim the lip, A. upon the other half of the hinge, A B, projecting over ounder the flange, b, as the case may be, in such manner as to come in contact with and act as a stop for the flange, b', when the blind is inadvertently raised, as shown and described.
72,604.—BREAST PUMP.—James Cole, Brooklyn, N. Y. I claim a breast pump, constructed substantially as described.
72,605.—BED BOTTOM.—Homer Cook and Chas. E. Simmons, Wankers, Ill.

12,002.—BREAST FUMP.—James Cole, Brooklyn, N. Y.

1 claim a breast pump, constructed substantially as described.
72,605.—BED BOTTOM.—Homer Cook and Chas. E. Simmons,
Waukgan, Ill.

We claim the combination of the short bars, C C C C, with the horizontal
bar, D, for the surpose of equalizing the pressure upon the upper frame, so
that all parts of it shall settle alike. Also, the application of two sets of
these bars to the same end or side of the bed bottom, to say the upper frame
and prevent all swaying, all constructed, combined, and applied substantially
as and for the purpose described.
72,606.—LABELLING BOTTLE CORKS.—Frederick W. Copcutt,
New York city.

I claim the combination of the metallic label, c, with the holding clamp.
I, bottle, A, and cork, C, substantially as and for the purpose specified.
72,607. — AUTOMATICALLY-OFERATED SEWING MACHINE.—
Gustawa Cuppers, New York city.

I claim, ist, The method, herein described, of operating aswing machines
and other machinery, automatically, by means of a spring or spring comshaft of the mechanism for operating said machinery included with the driving
thaft of the mechanism for operating said machinery included with the driving
thaft of the mechanism for operating said machinery or espringer, as an
attracticed and wound upon the driving shaft, shall cause the rotation of said
shaft, as and for the purposes set forth.

2d, The combination with the main or driving shaft, A, of the rubberspring
band or beit and spirally grooved conical barrel, upon which said band is
wound, aubstantially in the manner and for the purposes set forth.

3d, The combination with the main shaft and the rachet wheel, s', of the
shaft, as and for the purpose set forth.

4d, The combination of the lever, E, and the spring pawh which it carries,
with the rachet wheel, b, and stop or projections formed in roar of said
wheel, substantially in the manner and for the purposes set forth.

4th, The combination of the lever, E, and the spring pawh which it carries,
with the rachet wheel, and a

-MECHANICAL MOVEMENT.—Caleb M. Currey, Pon-

72,608.—MECHANICAL MOVEMENT.—Calculated the combination and arrangement of the crank shaft, B, lever, F, and connecting rod, G, with their described accessories, C D E, as and for the purposes set forth.
72,609.—BLIND CATCH.—Joseph Currier, Portland, Me. I claim the combination of the lever, K, connected with the stud, 2, as described and employed, as and for the purposes set forth.
72,610.—COAL STOVE.—Alfred Dart, Carbondale, Pa. I claim the central cone, I, when provided with the wings, i1, and attached to the grate, substantially as and for the purpose specified.

to the grate, substantially as and for the purpose specified.

72,611.—BRIDGE GIRDER.—Joseph Davenport, Massillon, O. I claim, ist, The arch, composed of the string pieces, A and B, shoes, h h, tension boils, a a, main braces, c c, and counter braces, d d, the several parts being arranged in the manner and for the purpose herein specified.

when asid braces of the distribution of a truss, when asid braces of the several parts of the substantial parts of the several parts of the substantial parts of the several parts of the substantial par

C, lower string, e. the whole being arranged as shown, and for the purpose special and boils, e. the whole being arranged as shown, and for the purpose special field.

72,612.—PLANETARIUM.—John Davis, Allegheny city, Pa. I claim, its, Representing the axial motion of the planets and the orbital motions of the statelities by imparting motion to general placed on the outer ends of arms radiating from a series of concentric placed on the outer ends of arms radiating from a series of concentric disks, 1, 2, and 4, rotated by a single pinion, 3, constructed and arranged substantially as described. 2d, Proving the earth, E. at one pole, so that by its own weight or gravity its axis will be constantly inclined at the desired angle to the plane of its orbit, substantially as herein described, and for the purpose set forth.

72,613.—PROCESS OF FUMIGATION FOR DESTROYING INSECTS OF HOP VIEWS AND OTHER PLANTS — John Deans, Conneant, Ohio.

I claim the mode of destroying insects by fumigation with the smoke evolv-

ed by burning a mixture compounded substantially as set forth, in praximity to hop or grape vines.

72.614.—PAINT.—William J. Dodge (assignor to himself, James L, Humphrey, and Daniel D. Smith), Syracuse, N. Y. I claim the improved paint, prepared or compounded substantially as herein specified, and for the purpose set forth.

72.615.—WEIGHING SCALE.—Laben Eddy, Taunton, Mass. I claim the combination as well as the arrangement of one or two weighted arms, F G, and a curved arch or limb, B, with the diametric lever, C, and the scale pant, E, or its equivalent, supported thereon, substantially as set forth, and this, whether the limb be affixed to the diametric lever, C. and the scale pant, E, or its equivalent, supported thereon, substantially as set forth, and this, whether the limb be affixed to the diametric lever, or to the stand thereof, as explained.

And the scale pant, E, or its equivalent, supported thereon, substantially as set forth, and this, whether the limb be affixed to the diametric lever, or the stand thereof, as specified.

72.516.—Lighting AND EXTINGUISHING GAS.—MOSES G. Farmer, Salem, Mass.

I claim the combination of a straight, electro-magnetic bar, with its pole which permanent magnets may be either simple or compound.

Also, for use in combination with the gas burner of a street gas lamp, box or gas chamber, containing an electric spark-generating mechanism, and mechanism as described, for opening with the current in one direction, and closing with the current in the opposite direction, a vaive, said box containing gas, and being arranged to be located at or near to the burner, and in a circuit, substantially as set forth.

Also, giving motion to ass valves, or obser mechanism, by means of the above-described combination of electro and permanent magnets, whether the arranges means of the course of the current in agency, the primary and secondary coils, and the electro and permanent magnets, whether the arranges means of the current.

Also, the arrangement of the burner, the cigning points

and benzole.
72,618.—Planing Machine.—Benalah Fitts, Newark, N. J. I claim the arms, s and i, when constructed to support the gear wheels, and arranged to operate with wheels, c and i, substantially in the manner and for the purposes described.

72,619.—PLANING MACHINE.—Benaiah Fitts, Newark, N. J. I claim forming recesses, E. E., in frame, a, and extending the line, h. far

I claim forming recesses, E.E., in frame, a, and extending the enough, and for the purpose of transferring the vertical cylinder beyond lines drawn from the ends of the cylinder, c, perpendic axis, substantially as shown and described.

72,620.—Pump.—G. R. Forsyth, Pemberton, Ohio.

1 claim the combination of the beliews with the pump, substantially

12,020.—FUMP.—G. R. Forsyth, Pemberton, Ohio.
I claim the combination of the bellows with the pump, substantially as and for the purpose set forth.
72,621.—INK FOR PAPER RULING.—Lewis Francis, New York city, assignor to W.O. Hickok, Harrisburg, Pa. I claim making machine ruling ink substantially as herein described.
72,622.—CULITYATOR.—J. T. Frankeberger, Hensely, Ill.
I claim, ist, The combination of the beams, G.G. when hinged at their front ends to the bar, A. substantially and the standards, H. the handles, R. and bars. F and A., the whole constructed and operating substantially as 12,862.—It substantially as 14 herein described.

herein described.

72.623.—HARROW.—J. T. Frankeberger, Hensly, Ill.

I claim the harrow, A, the supplemental barrow, D, and the handle, i
whole combined and operating substantially as herein specified.

72.624.—HAY SPREADER.—C. R. Frink, Norwich, N. Y.

I claim, 1s, The driving wheel rim, A, the friction wheels, B B, In action with the spokes, C C C, when applied to and for the purpose specified.

I claim, 188, the circus, and the median with the spokes, C C C, when applied to and for the passive scribed.

2d. The colled fork tines, A. cross head, b, set screws, e.e., in connection with rods, D D, substantially as and for the purposes set forth.

72,625.—PROCESS FOR MANUFACTURING ALBUMEN.—Jean Michel Fuchs, New York city.

1 claim the process substantially as herein described of manufacturing or extracting albumen from blood.

72,626.—AMALGAMATOR FOR ORES OF GOLD AND SILVER.—

72,020.—AMALGAMATOR FOR CAME STATES AND ADDRESS OF THE STATES OF THE STA 3d, The shaft, K. In Combination what we do many persons a stantially as specified.

4th, The combination and arrangement of the shaft. E, collar, H, cone, G', and mouth, O, or end of pipe, U, substantially as described.

5th, The pipe, L, when stiached to the pipe, D, substantially as and for the purposes described.

6th, The tab, B, pipe, C, and cylinder, A, in combination with the pipe, D, substantially as specified.

72,627.—Photographic Camera.—Franklin B. Gage, St. Johnsbury, Vt.

72,627.—PHOTOGRAPHIC CAMERA.—Franklin B. Gage, St. I claim in combination with a camera, either one or two shutters or cutoffs, made movable or adjustable up and down therein, substantially as and for the purpose or purposes as specified.

Also the construction of each of fine cut-offs, viz., so as to be capable of being either contracted or expanded in longth, substantially as specified.

An othe combination and arrangement or the indicator and divided limb, forth, equivalents thereof, with the camera and each of the cut-offs, as set forth.

Also the combination of the friction apparatus, or its equivalent, with the camera and each cut-off, or with the same and the indicator and its limb, or their equivalents.

camers and each cut-off, or with the same and the indicator and its limb, their equivalents. 72,628.—Voltaic Pile.—Alfred C. Garratt, Boston, Mass.

T2,628.—VOLTAIC PILE.—Alfred C. Garratt, Boston, Mass. I claim as my invention the improved voltate pile or battery composed of the two different metals, in the form of bars, arranged with a surje of cloth between each two pairs of them, and with a space between the bars of each pair, such bars being connected at their ends as set forth, the whole being held in place by a frame, substantially as described.

Also in a battery of such kind, the arrangement and combination of metalle pins or tacks, n, and solder, e, with the two sine and brass or copper bars, by the being as specified.

72,629.—BOOK FOR BOOKEEEPING.—J. H. Gleim, St. Louis, Mo. I claim, ist. The combination of the alternate cash journals, 1 and 2, pared respectively with odd, and even numbers, substantially as and for the purposes set forth.

3d, The combination of the balance columns, 6, with columns, 1, 2, 3, substantially as and for the purposes set forth.

4th, the combination and arrangement of the ledger column, 9, with columns, 1 and 3, substantially as and for the purposes set forth.

Gottlieb, Boston, Mass.

I claim the clasp made as described, viz., with the clamp wire bent and granged and combined with the two jaws in manner as explained.

2,631.—MEDICAL VACUUM APPARATUS.—John G. Hadfield,

72,631.—MEDICAL VACUUM APPARATUS.—JOHN G. HBUHCH, Cincinnaid, Ohio.

I claim, ist, A medical vacuum chamber, A, having the elevated neck, I, with face opening, I, and an open rear, closed by a door, C, and fastening devices, substantially as set forth.

2d, The chair, L, canable of being swung out or into the case, in the maner and for the purpose set forth.

2d, Such a chair, when adjustable in hight upon its axis, substantially as set of the continuous with the element of claim first, the parts, D g F F G G H H, or their equivalents, by which the door is made to bear with an equal and air tight presume at every part.

3th, In the described combination, the adjustable foot rest, N, and notched post, P, as set forth.

6th, In this connection, the arrangement of the manifold, S, two or more fancets, T T, and coupling neck, S', provided with an outwardly opening valve, S, as and for the purpose set forth.

7th, The limb receptacles, U u, when combined with the adjustable hand rest X X x Y.

2,632.—STRINGING BOW DRILL STOCK.—D. Frank Hartford, Boston, Mass. Relaim combining and arranging the four strings, H H' H" H", with the ulleys, A B, when said pulleys work substantially as described, and for the

pulleys, A B, when said pulleys work substantially as described, and for the purpose set forth.

72,633.—WOOD SCREW.—Hayward A. Harvey, Orange, N. J. I claim a server, constructed in the ordinary manner, with the exception that the threateness of the eppers and the under side than on the upper, substantially as and for the purpose set forth.

72,634.—WOODEN CHAIR-SEAT.—Levi Heywood (assignor to Heywood Brothers and Company), Gardner, Mass.

I claim a wooden chair seat, provided with a strip, a, whose grain crosses to the seat itself, substantially as and for the purpose set forth.

72,635.—SOCKET FOR REVOLVING CHAIR.—Levi Heywood (assignor to Heywood Brothers and Company), Gardner, Mass.

1 claim the within described socket, B, for receiving the upper ends of the legs of chairs, substantially as set forth.

73,636.—APPARATUS FOR GRINDING AND POLISHING CYLINDINGAL CONCATE SURFACES.—Wm. C. Hicks, New York city.

DRICAL CORGAYE SURFACES.—Wm. C. Hicks, New York city.
DRICAL CORGAYE SURFACES.—Wm. C. Hicks, New York city.
The surface surfaces and the surfaces substantially as hereted in the surface being operated upon, while the said tools and surface
are moved (by any suitable mechanism) relatively to each other, in the man

ner set forth. 72,687.—Manufacture of Matches.—Edward J. Hill, Mil-72,687.—MANUFACTURE OF MATCHES.—Edward J. Hill, Milwankee, Wis.

1 claim, ist, The discovery of the quality or property of the mass or paste
usually employed to produce ignition in matches, tapers, lamp, cigar, orgas
lighters, which permits the same to be cut without friction or percussion,
especially whee spread in thin sheets of suitable material, after the same has
become dry.

24. The use of twine, or yarn, or thread, or equivalents, in the manufac
three of friction or percussion matches.

25. The peculiar manner of placing the twine, yarn, or thread for dippling,
as her in claim combinations to produce the results respectively here
in described.

24. The use of twine, or yarn or thread for dippling,
as here accompanying this specification.

25. The putting but packing matches, tapers and lighters, in friction
yrappers, cases, or yand packing matches, tapers and lighters, in friction
wrappers, cases, or yand packing matches, tapers and lighters, in friction
of the transfer of the putting the same go and in hand with
can other in the various combinations herewith presented, and all permutations thereof.

6th. The application of varnish after dipping, as herein described, or oth-

nilally as set forth, in praximity

7th, Also, paper for matches, as herein specified, in the combinations set
forth.

7ce (assigner to himself:

8th. The protection of the nated ends of the matches, tapers or lighters, in Sth. The protection of the pasted ends of the matches, tapers or lighters, in manner and form, by folded paper or other suitable material, as in this application described.

72,638.—SCYTHE.—Charles M. Hodges, Mansfield, Mass., assignor to himselt, Wm. O. Capron and Nathaniol Whitmore.

1 claim the combination as well as the arrangement of the back piece, C. with the blade, A, and the cap piece, B, arranged and applied with respect to each other as set forth.

with the blade, A, and the cap piece, B, arranged and appuned with reach other as set forth.

72,689.—MACHINE FOR SAWING BARREL HEADING.—Calvin J. Holman, Chicago, ili.

1, Holman, Chicago, ili.

1, Holman, Chicago, ili.

1, Holaim, 1st, The combination of the adjustable bed, F, planing cylinder, G, and saw, S, constructed and arranged to operate substantially as and for the purposes set combination of the bed, F, planing cylinder, G, carriago, C, and saw, S, constructed and arranged to operate in the manner and for the purposes set forth.

72,640.—STAVE MACHINE.—Wm. E. Hopkins, Parkman, O. I claim the adjustable feed or saw table, for regulating the degree of our-

I claim the adjustable feed or saw table, for regulating the degree of our-step of the staves deform to the diameter of the cask or vessel to the the stave of the stave of the diameter of the cask or vessel to the the stave of the stave of the diameter of the case of the tranged and operating as described. 3,641.—STEM WINDING WATCHES.—Edwin B. Horn, Bos-

73,641.—STEM WINDING WAIGHEST to make a stacking to and placing within the ring gear, B, the main pring of a watch, said ring gear being recessed into the face plate, and being made to wind up the main spring by means of a small pinion stitached to a winding stem.

2d, The ratchet wheel, E, and pawl, F, in combination with the ring-gear, B, when the said ring-gear is used for winding up the main-spring, the whole being made substantially as described, and for the purpose set for the Sd, The combination and arrangement of the levers, L L L', the pinions. P' P', and the ring-gear, B, substantially as described, and for the purpose set for the strength.

P^{*}P^{*}), and the ring-gear, B, substantially a set torth.

72,642.—LAP-SEAM GUIDE FOR SEWING MACHINES.—Otis W Horr, Chicopee, Mass.

10 claim a lap seam guide for sewing machines composed of two pairs of guiding plates said plates being arranged with reference to each other and also ridged, grooved and provided with stops, tand o, and the ear place, wall constructed and operating substantially as and in the manner hereit forth.

all constructed and operating substantially set forth.

92,643.—Gas Regulator.—H. G. Hubert, New York city.

I claim, 1st, The use of a metallic disphragm.

2d, The combination of the disphragm, C, link, F, lever, L, and valve, V, stranged substantially in the manner set forth.

3d, Making the fulorum of the lever, L, adjustable from outside the instruand by means of a serew, D, arranged as described, or any mode substan-

ment by means of a serew, D, arranged as described, or any mode substantially the same.

4th, The use of a lever for multiplying the sensitiveness of a gas regulator by increasing the throw of the valve thereof.

72,644.—HARVESTER RAKE.—W. B. Johns, Cumberland, Md. I claim, ist, The bevel gear, E, centrally placed on the main axle and when used directly for driving the outlers and the rake both, substantially as de-

I claim, use, the revising the cutters and the rake both, substantially as described in combination with the cutters and reef for laying the grain upon the platform or grain table a rake revolving at right angles to the forward movement of the machine for raking off and delivering the grain in gavels at the side of the machine for raking off and delivering the grain in gavels at the side of the machine for raking off and delivering the grain in gavels at the side of the machine, as set forth and described.

73.645.—REVOLVING OVEN.—John A. Kinkele, Sacramento City, Cal.

I elastin, 1st, The oven constructed as described consisting of the inner wall, B, placed between the outer case, A', having cold-air openings, a, and the oven, C, all supported by an annular plate upon the foundation, A, the hot and cold annular air chambers, H H', communicating with the common flue, J', the revolving hearth, E, of the oven supported upon the plate, E', by a pivot and operated by means of the gear wheel, I, as herein described for the purpose specified.

24, The rotary hearth, E, when constructed of tile or fire brick, in combination with the oven, C, concentric wall, B, and casing, A', as herein described for the purpose specified.

72,645.—Table.—George Kuhlman, New York City.

I claim the application to tables of the arrangement of the cords, g, etc., pulleys, h h, etc., and spring catones, shown by Fig. 4, all used for extending vertically and supporting when extended the leaves, I and k, as heruinbefore described.

punitys, it in, etc., and spring caseness, shown by Fig. a. all used of extending vertically and supporting when extended the leaves, I and k, as heroimbefore described.

—James Lee, Jr., Charlestown, Mass.
—James Lee, Jr., Charlestown, Mass.
—I claim, ist. The combination of the rollers, E and B, the rack, D, rollers, F I, the tub or tank, A, with the heavy roller, G, all arranged and operating F I, the tub or tank, A, with the heavy roller, G, all arranged and operating substantially as described.

Ad, The combination of the rollers, E and F. with the heavy roller, G, all arranged and operating substantially as described.

Z,648.—STATE MACHINE.—Dixon Leewers (assignors to Ferguson & Lewers), Louisville, Ky.
I claim the save pusher or driver, B, when operated by the wheel, D, head, E, revolving slotted arm, F, shaft, I', arm, G, and pisman, I, or their cquivalents, substantially as and for the purpose set forth.

Zo,649.—MACHINE FOR CHANNELING ROCKS, ETC.—R. W. Love and Albert Ball, Windsor, Vt.

We claim, lat, in a rock-channeling machine constructed substantially as described the wheels, O and N, on the shaft, S, operating in connection with the wheels or gears which rotate or revolve the drills or catters, substantially as snown and set forth.

2d, in a rock-channeling machine having rotating cutters the devices for stopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by Sopping and also for reversing the freed apparatus either automatically or by S

72,000.—STEAM ENGINE GLOBE VALVE.—J. B. LOWEI, Bal-timore, Md.
I claim the combination of the hand wheel constructed with the clutch, y, and the square opening as described with the slowe, e, and valve atem, C, the latter being constructed as set forth and all the parts operating together substantially in the manner and for the purpose specified. 72,651.—BEEHIVE.—J. J. LOWET, Tennessee, Ill.
I claim, 1st, The moth chamber, A, with its entrances, a, breeding spiles, a', dor, a', and perforated plate, a''', substantially as described. 20, The movable sasbes, b'', with projections, b''', and plate, b'''', when com-bined with rods, b', sockets, y, and holes x, substantially as described. 72,652.—GUARD FOR CIRCULAR SAWS.—John Madden, Cleve-had, Ohio.

bined with rout, b., successive, and the route of the holds of the land, Ohio.

1. claim the herein-described adjustable circular guard, F., so arranged in relation to the saw, B. that the said guard and eaw shall turn on one common center and in the same plane so that the said guard will cover or expose more or less of the saw teeth upon one side only of the saw, substantially as and for the purpose specified.

72.653.—LAND ROLLER.—S. B. Mann, Indianapolis, Ind. I claim the combination and arrangement of the hollow cylindrical rollers, G. G., with the metallic balls, H. H., as and for the purpose specified.

72.654.—TOOL HOLDER.—J. P. Manton, Providence, R. I. I claim the combination in a tool holder of the wedge clamp, D, with the excible jaws, b. b., arranged too-operate in gripping an independent cutting tool, C, substantially as herein described.

72.655.—NAIL DRAWER.—Samuel Marden, Newton, Mass. I claim a cam, c, acting as a fulcrum to a lever, d, and as a lever to a jaw, b, substantially as described.

72.656.—STAMP WETTING AND PEN CLEANING INSTRUMENT.—Thomas P. Marshall, Trenton, N. J., Thomas P. Marshall, Trenton, N. J., Combined with a trough. D, substantially as described.

I claim a cam, c, seese sees be enablantially as described.

73,656.—STAMP WETTING AND PEN CLEANING INSTRUMENT.

—Thomas P. Marshall, Trenton, N. J.

I claim, ist, The two rollers, h and h', combined with a trough. D, substantiantilly as described.

2d, The rollers, hand h', on spindles caused to turn in a frame having snopaning, x, through which an envelope or other article can be introduced to the said spindles, d and d', each having a oylinder made of sponge, cloth or other a beorbent material the cylinders being from contacts with contaming water, all substantially as set forth.

72, 657.—GATE.—C. F. Mawley, Woodbridge, N. J.

I claim, ist, The combination of the gates, G, a.u.s. c, plvoted rods, D, when constructed as shown and arranged so as to operate by the platforms, 2d. The platforms, A. A', when privoted at their inner edges under the gates, 4d. The platforms, A. A', when privoted at their inner edges under the gates, 3d. The hinred p ank, F, when stanbed to the outer edge of the platforms and operating substantially in the manner and for the purposes specified.

3d. The hinred p ank, F, when stanbed to the outer edge of the platforms and operating substantially in the manner and for the purposes specified.

3d. The nonvable prop. M, or it sequivalent, in combination with the platform, A. A. then see continued as A. to descend.

5th, The combination of the lever, I, prop. M, rod. O, and bar, D, operating in the manner and for the purposes specified.

72,659.—Composition made up of the ingredients, substantially as described.

72,659.—LAMP BURNER.—William McCaine (assignor to himself, David McCaine and Daniel McCaine), as on see the ring and with respect to the second of the purpose of the parts, b b, arranged those the rest of the ring and with respect to the second of the purpose of the second of the parts, b, arranged there are set of the ring and with respect to the second of the parts, b, b, arranged the set of the ring and with respect to the second of the parts, b, b, arranged the set of the ri

73,509.—LAMP BURNER.—William McCaine (assignor to himself, David McCaine and Daniel McCaine), Groton, Mass.
I claim my improved air deflector as made with its parts, b b, arranged above the rest of the ring and with respect to the tube, a, so as when in use to contract the fame width wise at its base, as set forth.
72,660.—PRINTIMP PRESS.—J. W. McConnaid, Osgood, Ind. I claim the slides, L L, the sleeve, N N', and strips, 11, with the inking roller, 0, combined and operating substantially as set forth with the platen, F. 73,661.—MILL SPINDLE.—J. H. McMinn, Logansport, Ind. (Theodore J. McMinn, Administrator.)
I claim the mode of gradually starting or stopping millstones, substantially as set forth, by means of the following combination of parts, viz.; the spindle, a, cone, F. pinion, e, ring, g, tempering lever, h, clauch, c, and lever, d. 72,662.—SCHOOL DESK.—H. S. McKae, Muncie, Ind. I claim its book holder located in the back part of the lide of the desk, constructed, arranged and operated as herein recited.
72,663.—MODE OF SECURING FELLEYS.—M. J. Mellyn, Roxbury, Mass.

72,003.—HOUS OF SECONDAY AND A STATE OF SECONDAY Mass.
I claim the metalic plate, B, having a boit, C, and ribe, a a, when constructed and used in the manner and for the purposes set forth.
72,664.—CAR COUPLING.—W. J. Millar, McKeesport, Pa. I claim two coupling bars attached by bolts one to each of two opposite

draw heads, each coupling bar having an arrow shaped head and hook in combination with the hoper-shaped or conical ball nose, b, and pins or bolls over which the hoose side and couple, for the parpuse of kerming a

reliconnecting and disconnecting car coupling, substantially in the manner hereinhefore set forth.

72,665.—CAR COUPLING.—Simeon Mills, Madison, Wis.
I'claim the bar, I, jointed at x, so that it can be turned down and out of the way of door, L, and provided with a notch and as eye or hook when used in combination with an open-spring catch, J, and the hooked and pivoted coupling, C, as and for the purposes set forts.

73,666.—FASTENING FOR CARRIAGE CURITAINS.—Thomas A. Mitchell, Washington, D. C.

I claim the elastic strap, A, in combination with the metal tip, B, when the latter is provided with a buttonhole, substantially as described.

72,667.—Hinged Fishing Rod.—J. H. Montrose, N. Y. city. I claim a sectional fishing pole having the several sections, A B C, etc., sermanently connected by hinged Joints, constructed and arranged reliatively to the sections.

72,668.—ROCKING CHAIR.—C. J. Nelson, Rockford, Ill. I claim the spring shoes, a s, in combination with the chair, A, substantially as described.

72,668.—MACHINE FOR BENDING METALS.—John Noland,

y as described. 69.—Machine for Bending Metals.—John Noland, 72.669.—MACHINE FOR DERDING ARE two curves, the reverse of Lolain the former, A, on the edge of which are two curves, the reverse of but meeting each other, in combination with the levers, C and F, carrying rollers, or their equivalents, and so hang that the said rollers can be moved that of one lever in the arc of a circle concentric with that of one curve and the other in the arc of a circle concentric with that of the curve on the edge of the frame, all as set forth for the purpose specified.

72.670.—CONSTRUCTION OF CHECKERS.—Henry Nott, New York city.

779,670.—CONSTRUCTION OF CHECKERS.—Henry Note, New York city.

1 claim, 1s. The flange or rim, B, around the upper edge of the checker, as an authorise set forth.

2d. The cascicer made in the form of an inverted truncated cone, substantially as and for the purpose set forth.

72,671.—DRAG HOOK.—James Parish (assignor to himself and Joseph Creete, Chicage, Ill.

I claim, 1st. The rollers, D D, in combination with the stock, A, constructed substantially as and for the purposes specified.

2d. The combination of the grards or floats, C C, with the flukes, B B, constructed substantially as and for the purposes set forth.

2d. The combination and arrangement of the stock, A, flattened flukes, B, and bury line shackle, e, with the flusts, C, substantially as and for the purposes specified.

4th, A graphel or drag hook, constructed substantially as and for the purposes specified.

4th, A graphel or drag hook, constructed substantially as and for the purposes specified.

poses specified.

72,672.—FIRE ALARM.—I. T. Pease, Thompsonville, Conn.
I claim, let, The curved expansion bar, B, composed of two metals of different rates of expansion by best and the adjustable screw, B, when constructed and arranged sub-isanitally as herein described for the purpose of a

Tre alarm.

2d, The combination of the bar, B, the screw, S, the alarm movement, G, the levers, K and I, or their equivalents, substantially as berein

the lever, J, the levers, K and I, or their equivalents, substantially as herein described.

72,673.—CHUEN.—John Pelsor, Brooklyn, Ill.
1 claim, 1st, The staffs, E E, furnished with dasher boards, g, so constructed that the lower half of the boards on one staff will pass the upper half of the board, g, on the other without impliging.
2d, The box, A, the top, B, the staffs, E E, the arms, C, and pulleys, m and n, the whole combined, constructed and operating substantially as described.

73,674.—SHEEF SHEARING TABLE.—Oliver Perry and Clark Perry, Ortowille, Mich.
We claim the sill or bar, G, and strap, H, used upon the table, B', substantially as described.

73,675.—THRASHING MACHINE.—M. E. Phillips, Lena, Ill., assignor to himself and George Wetzel.

1 claim, 1st, The combination as described with the thrashing cylinder, D, and stationary slata, e, of the rotating rakes, E, having their shafts connected at each end with the same case wheels which drive the thrashing cylinder, cylinder, D, the parallel slata, e, the rotating rakes, E, the longitudinally ribrating acreen, F, and the shaking shoe, H, with the fas, K, for the purpose set forth.

3d. The combination as described of the thrashing cylinder, D, with the ibrating screen, F, and the shazing suve, a, transling cylinder, D, with the st forth.

3d, The combination as described of the thrashing cylinder, D, with the same until the stringer of the same combination of the same co

gear wheels.

4th, The combination as described of the spiral rasped surface beaters of the hulling cylinder, M. with the yielding concave, m.

5th, The combination of the closed fan case, K, with the adjustable regulation yaive, a, controlled by the spiral detent, si, as set forth.

5th, The combination exhatantially as described of the threshing cylinder, but the combination exhatantially as described of the threshing cylinder, and the horizontal problem, and the combination with the hulling cylinder, M. of the vibrating acreen.

7th. The combination with the hulling cylinder, M. of the vibrating acreen.

haft.
The combination with the hulling cylinder, M., of the vibrating acrees,
and elevator, I. all arranged and operating as described.

8h. The combination with the hulling cylinder, M, of the elevator, O, the
asking shoe. H, the fan, E, and the revolving screen, J, all arranged and
perating as described.

2,678.—OPERATING FEED WHEELS IN SEWING MACHINES.

72,676.—OPERATING FEED WHEELS IN SEWING MAURICES-G. W. POWERS, Boston, Mass.
I claim the combination of the lever, friction pawl, and entering wedge or pin together and with the feed wheel and rocker plate, when the whole are constructed and arranged to operate substantially as set fortin.
72,677.—BRUHH AND MOP HEAD.—T. T. Prosser, Chicago, Ill. I claim, 1st, The combination of the myosble ferrule with the pins in the handle of the mop, alles for the purposes set forts.
24, The combination with the handle of a brush and mop holder of a ferrule provided with screw threads upon its interior surface and with lugs on the jouisides, all as for the purposes set forth.
24, The combination of the ferrule, by provided with lugs, c. c, and the lever, the latest of the purposes set forth.
25, The combination of the ferrule by the combination of the ferrule of the purposes set forth.
26, The combination of the ferrule of the purposes set forth, at one end and also to operate the wire that holds the mop, all as for the purposes set forth.
26, Harvester.—Abraham Quick, W. S. Opie and A. 72,678.—HARVESTER.—Abraham Quick, W. S. Opie and A.

J. Farrand. Raritan, N. J.

J. Farrand. Raritan, N. J.

We claim, 1st, The combination substantially in the manner described at inger beam with the main frame of a barvestor by means of three joints, in 'a and I, arranged in the same vertical plane, or nearly so, when two of said loints have a vertical and the third an axial movement on their pivots for the purpose of allowing the cutting apparatus both a vertical and an axial movement.

novement.

2d. The combination with a harvester of an odometer, arranged and operating substantially as and for the purpose described.

3d. The chain carrier arranged on the drag bar, as described.

72,679.—RAILWAY CARRIAGE.—B. L. Randall, Roxbury,

d. The chain carrier arranged on the drag bar, as described.

73,679.—Railway Carriage.—B. L. Randall, Roxbury, Mass.

I claim, ist, The combination as well as the arrangement of the lavers, E. and the springs, L. with the platform and truck frame.

And the springs, L. with the platform and truck frame.

And the combination as well as the arrangement of the lavers, E. P. the springs, L, and the springs, G, with the platform and truck frame.

3d. Aler the combination as well as the arrangement of the levers, E. P. the springs, L, and the springs, H, with the platform and truck frame.

4th. Also the combination as well as the arrangement of the levers, E. P. and the springs, I G. H. with the platform and truck frame.

4th. Also the combination as well as the arrangement of the levers, E. P. and the springs, I G. H. with the platform and the truck frame.

4th. Also the combination as well as the arrangement of the levers, E. P. and the springs, I G. H. with the platform and the truck frame.

1 claim the buckets, B. B. slightly curved and having bottoms which taper in width and thickness as shown and described when connected between the plate and circular metallic rim. E. all constructed and used as and for the platen, e. the bars, gl and gl, the links, h and k, or their equivalents, the toothed rack, j, and levers, m. all arranged and operating substantially as as to forth.

12.683.—CHURN.—John Risher, Delaware, Ohio.

1 claim the dasher, B. with its arms, C. C. constructed as herein described and used in the box, A, in the manner and for the purposes described.

72.683.—CHURN.—John Risher, Delaware, Ohio.

1 claim the dasher, B. with its arms, C. C. constructed as herein described and used in the box, A, in the manner and for the purposes described.

72.683.—CHURN.—John Risher, Delaware, Ohio.

1 claim the dasher, B. with its arms, C. C. constructed as herein described and used in the box, A, in the manner and for the purposes described.

72.684.—Pen And Penchl.

73.685.—CHURN.—John Risher, Delaware, Ohio.

74.68

72,685.—CLOTH PLAITING BLAUBERS.

phia, Ps.
1 claim an adjustable blade, C, arranged to operate in combination with an adjustable bar, b, substantially as and for the purpose described.

72,686.—BELT SHIPPER FOR MULES.—W. H. Saltmarsh, Waitham, Mass.
1 claim the combination and arrangement of the swinging bar, M, with the link, N, the rod, D E', and the shipper, E F, substantially as described and for the purpose set forth.

1 Company of the shipper of the swinging bar, M, with the link, N, the rod, D E', and the shipper, E F, substantially as described and for the purpose set forth. link N. the rod. D. E., and the shipper, E. F., substituting a task for the purpose set forth.
72,687.—Solar and Transit Instrument.—Wm. Schmolz,

I ciaim the hour-circle, N, tastened upon the base, P'A', with a solar apparatus attached upon the axis, P, in combination with a surveyor's transit, substantially as described and for the purposes set forth.

72,688.—MACHINE FOR MAKING RINGS.—William Serviss,

(2,080.—MALHER FOR MALHER ALREW.—Within Servins, Sidney, Ohio.

I claim, ist, The interchangeable mandrels formed with a bole near one one, in combination with the shaft furnished with a crank, substantially as a d. The arrangement of the mandrel upon the shaft, C. with reference to the anvil, B, furnished with provey, a, in its upper suriase, substantially as and for the purpose specified.

3d, The applicamental flat-faced anvils, A* B* C*, arranged in relation with the main avil, B, and the mandrel on the shaft, C, substantially as and for the purpose specified.

73,689.—STEAM GENERATOR.—Geo. V. Sheffield, Worcester, Mass.

Associated the combination of the state of the state of the combination of the combination of the combination of a fre-injector and steam superheater, under the arrangement described, whereby the flame and heated gases shall be taken from the fre-chamber, and forced or driven, under pressure, into the bolier or steam generator, substantially as herein shown and set for the driven, under the combination, with the cylinder, F, and fire-chamber G, of the

hamber, c, piston, H, fire-pipes, I and f, substantially as and for the purposes 72,690.—BELT-FASTENING.—George V. Sheffield and Byron Whitcomp, Wordsster, Mass.
I claim, lat, A belt-fastening, constructed substantially as shown and in-

scribed.

2d, Making one half or a part of the shanks of the hooks, a, longer than the o'hers, for the purposes stated.

72,691.—CLEANING COTTON.—Thomas Shapard, Haywood

72,691.—CLEANING COTTON.—TRUMES SHAPER, LIE, WOOLD COUNTY, Tenn.

county, Tenn.

leiam the list-room, as above described, made of slats, allowing the dust and dirt to escape, in lieu of the ordinary close lint-room, which does not allow the dust and dirt to escape.

72,692.—Sash Lock.—Almos M. Smith, Chicago, Ill.

I claim, ist. The combunation of the lifter, L. jaws, D. and levers, E. arranged and operating substantially as and for the purposes specified.

74, In combination with the above, the arrangement of the bolt, H, operating as shown and described.

75, The arrangement of the springs, h h. in combination with said levers, E. and bolt, H, substantially as and operating as set forth,

72,693.—Fence.—D. N. Smith, Salem, and E. F. Olds, Lyon, Mich.

Mich. We claim the continuous rider, G. as arranged, in combination with the races, E. stakes, C. and rails, B. in the manner as and for the purpose set

72.694.—HEATING POTTERY OVENS AND OTHER LIKE FUR-TAGUS.—HEATING FOTTERY UVENS AND OTHER LIKE FURTROES.—Henry Specier, Frenton, N. J.

I claim a stoam-pipe, in combination with a "fire-mouth," for heating pottery ovens, kilns, and for other like ovens, substantially as described.

72,695.—PARASOL.—Cornelius St. John, Charlestown, Mass. I cleim, as a new or improved article of manufacture, and as my invention, the sun-sinde, as composed of the stick, A, the corrugated paper body, B, and the metallic expander, C, made and arranged substantially in manner and so as to operate as described.

Also, the expander, C, made as explained, that is, of a single piece of wire, first beat in a circle, and next downward from the circle, at an acute angle to its plane, and afterwards in a heltx, the whole being as shown in the drawings.

logs.

72,096.—Grain-Separator.—F. Swift, Hudson, Mich., assignor to himself and Horace Wilson.

1 claim, 1st, The fan-shaft, C. provided with two sets of wings, secured on the different positions, and with a pulley between them, as and for the purpose.

I claim, i.t., The nan-state in the factor of the factor o

At, palleys, D. K. screens, G. I., with aprings, L. L. and Dat, A., and Counsel Larray, arranged and operating substantially as specified.

72,697.—GASOLINE LOCOMOTIVE HEAD-LIGHT.—J. B. Terry, Hartford, Com.

I claim, Jai, A locomotive head-light or lantern, consisting of the combination of a vessel to hold the gasoline or other similar hydrocarbon inquid with an internal or external bester to vaporize such liquid for the direct production thereform of illuminating gas, as set forty and the building vessel, provided with the or more humars, of an internal coil or surrounding jacket, admitting steam from the locomotive boiler to heat the liquid within the vessel, as shown and described.

24. The combination, with the hydrocarbon vessel, of an elastic disphragm and stopper or valve, operating in connection with the steam-admission pipe, substantially as described, so as to regulate the flow of steam and pressure in the vessel, as set forth

429. The substantially as described, so to regulate the flow of steam and pressure in the vessel, as set forth at the vessel, as the shall yet and for the purposes set forth.

72,698.—SPIRIT METER.—Issac P. Tice, New York city.

73. I claim, lat, A measuring-can, so constructed and operating as that, after the measured quantity or volume, and the surplus or ameasured quantity, will be discharged into different receivers, substantially as aspecified.

24. The combination of a measuring-can and weighing-can or cans, separate and distinct from each other, so that the several operations of these devices will give the specific gravity of the faild by weight and measuring-cans, arranged and operating in such unkness as that a fixed quantity of pairit, an eombination with a measuring-can, an extra or separate weighing, can, for weighing the proof of externions with a measuring-can, an extra or separate weighing, can, for weighing the common with a primary receiver, A, of an overflow-pipe, or its equivalent, arranged to conduct the surplus supply from sair receiver to the surplus or o

chambers, in combination with siphonic discharge pipes, essentially as abown and described.

3d, A disphragm measuring-can, operating substantially as described, in combination with a weighing-can or device for ascertaining the proof by weight and quantity, as specified.

4th, Providing the measuring-can and weighing-can, or either, with str-dash pots or cushioning devices, essentially as herein set forth.

5th, The combination of the floats, F.F. and catches, H.F. or the equivalents of these devices, and titing-hopper, with a measuring can, having a siphonic discharge, as bistantially as specified.

72,700.—SPIRIT METER.—Isaac P. Tice, New York city.

I claim, ist, The combination, in a spirit meter, of a weighing-can and can for determining volume, receiving in a given time or times an equal or proportionate supply with the weighing-can, for ascertaining the specific gravity of the fluid.

2d. The combination of a float or piston with the can-determining volume for a given weight, to actuate in any suitable manner a registering device, substantially as specified.

3d. Controlling the filling and discharge of the can, which determines volume for a given weight, by the action of the weighting-can, essentially as herein set forts.

ume for a given weight, by the action of the weighing-can, essentially as herein set forth.

4th, In combination with the devices for determining specific gravities, the choper, A, divided as at b, and furnished with separate discharge pipes, D and E, substantially as specified.

5th, the combination of a weighing-can or device, volume-determining cylinder or can, H, with its piston, I, valve, L, operated by the weighing-can and rear, E, essentially as described.

72,701.—SPIRIT METER.—ISAGE P. Tice, New York city.

1 claim, its, the combination, with a spirit meter, or weighing and measuring-cans thereof, of a thermo-compensating device weighing and measuring-cans thereof, of a thermo-compensating device weighed, or weighed and automatically to contract through the meter, substantially as specified.

5th Regulating, in an automatic manner, the action or discharge from the weighing-can of a spirit meter, by the varying specific gravity of the fluid, essentially as herein est forth.

3d. The combination, in a spirit meter, of devices automatically operating, by the varying desirités and temperature of the fluid passing through the meter, to regulate the action of the weighing-can, substantially as specified.

4th, The combination of the toe, I, on the weighing-can, substantially as specified.

5th. The toggle-joint, I, rods, k k, and toe, I, in combination with a float,

weight on said rods, to regulate the action of the weighing can, substantially as specified.

Stin, The toggle-joint, I, rods, k k, and toe, l, in combination with a float proceed by the specific gravity of the spirit, essentially as and for the purpose herein set forth.

operated by the specific gravity of the spirit, essentially as and for the purpose herein set forth.

72,702.—SPIRIT METER.—JEASC P. Tice, New York city.

I claim registering the specific gravity or strength of the spirit passing the specific gravity or strength of the spirit passing the state overflow or surplus of the one can is weighed and operating as second, while the main contains of such first can are diverted from passing through the second or lower can, substantially as specified.

72,703.—COMBINED PLANTER AND CULTIVATOR.— John Vangha, College Grove, Tenn.

I vangha, College Grove, Tenn.

I vangha, College Grove, Tenn.

I vangha, College Grove, Tenn.

2d. The combination of the draw-beam, A, wings, B B, ploughs, p p, when used in connection with a cotton-cultivator, substantially in the manner and for the purposes set torth.

2d. The combination of the draw-beam, A, wings, B B, ploughs, p P, opening plough, S, frame, F, wheels, D P, shaft, C, seed-box, I, conductor, b, and covering plough, 4, substantially as shown and described.

2d. The covering-plough, 4, when hung loosely between two guides, g g, so as to have a free vertical, but no interal motion, substantially as described.

2d. The covering-plough, 4, when constructed with hooks, h h, which operate, in connection with a cotton-planter and cultivator, substantially in the manner and for the purposes specifier. ne purposes specifie :. —EXTENSION BED-LOUNGE,—Charles F. Vollmer, Har-

12), 104.—EATEMENT BED DOUGHES,—Chaines 2. Volumes, Fishers, Fa. improved extension-lounge, formed by the combination of I claim, ist, An improved extension-lounge, formed by the combination of the following parts: An ordinary top, consisting of a seat, a, arm.-rest, c, and beed, or pillow, G, the base, B, having bottom, a', and the automatic closing and opening legs, F, all as herein described.

2d, The combination of top, a b c, base, b, extension, D, legs, f, and pillow, G, substantially as and for the purpose described.

72, 705 — MACHINE FOR MAKING PAPER COLLARS.—Oscar F. Washburn, Bridgewater, Vt.

Washburn, Bridgewater, Vt.
I claim, ist, A collar-formed die for cutting out a collar, when provided with an embossing device situated within the cutting edge of the die, substantially se described.

7d, A collar-formed die for cutting out a collar, when provided with an embossing device and an indentation for folding a collar, substantially as de-

oribed.
Sd, A collar-formed die for cutting out collars, when provided with an mbossing device and indentations for button holing, substantially as de-

304, A Counterbase of the combination of the collar, when provided with an indentation or crease for iolding, substantially as described.

3ct. A movable platen, in combination with a collar-formed die, having indictis cutting edge as embossing device, substantially as described.

3ct. A movable platen, in combination with a collar-formed die, having indictis cutting edge as embossing device, substantially as described.

6ct. A movable platen provided with cutture, in combination with a collar-formed die, having an embossing device and indentations for button-holing, all operating together substantially as described.

3ct. A collar-formed die combination with a movable platen provided with cutters, and with a folding-kni c, substantially as described.

3ct. A collar-feeding mechanism, and a collar-cutting and embossing mechanism, substantially such as described, in combination.

3ct. A roller-feeding mechanism, and a collar-cutting and embossing and a button holing mechanism, such as described, in combination.

10th, A roller-feeding mechanism, a collar-cutting and embossing, a button-holing and a folding mechanism, substantially such as described in combination.

norms and a roung mechanism, a collar-cutting and folding mechanism, a collar-cutting and folding mechanism, a collar-cutting and folding mechanism, aphasantiall such as described, in combination.

12th, The combination of geared feeding-rollers, E, with toothed arm, J, and lever, O, constructed and operating as and for the purpose described.

13th, The combination of shaft, F, eccentrics, K M, rods, L M2, movable platen, I, slide, N, and folding-knife, H, substantially as and for the purpose described.

ribed. th, The machine herein described, when constructed, combined, and op on ag to cut, emboss, button-hole, and crease a collar to be folded at a single ration or revolution of the main shaft, all as set forth.

operation or revolution of the man soart, and as set orth.

72,706.—SPOON BLANK.—Le Roy S. White, Waterbury, Conn. I claim the spoon blanks, of such form and so cut or stamped out of the bar or plate without intervening earn, substantially as specified.

72,707.—STEAM ENGINE SLIDE VALVE.—Charles Whittler, Boybury, Mass., sassignor to "Union Steam Valve Company." I claim the arrangement of the balance slide valves, in relation to the steam chest and cylinder, as and for the purpose set forth.

72,708.—SLED BRAKE.—J. W. Wight, Chicago, Ill.

I claim the brakes, C, in combination with a sled, A, when constructed and operating substantially as and for the purposes herein described. 72,709.—BREAD CUTTER.—G. D. Williams, Chicopee, Mass. I claim the device consisting of the shelf, A, gaide-frame, C, knife, B, and signatable bar, F, combined and arranged substantially as and for the pur-

Pose shown.

72,710.—Andominal Supporter.—Wm. M. Young, M. D.,
Trempe leau county, Wis.

1 claim the form or shape of the abdominal plate, and the form and construction of the body band.

REISSUES.

REISSUES.

36,503, dated September 23, 1862; reissue 2,819.—Skatz.—
Phineas Smith, New York city, assignee of Oliver G. Brady.
I claim, 1st, in skates, the side clamps, J J, arranged near the toe of the skate, and the tigbtening means, L, adapted to draw the same forcibly together, all combined and arranged as and for the purposes herein set forth.
2d, Also, in skates, the set screws, k k, arranged as specified, in combination with the tirhtening means, L, and side clamps, J J, so as not only allow the side clamps to be drawn forcibly fogether, to belief the distribution of the standard of the boot, runner, A, and adjustable tightening hook, E, as herein shown and described.

in shown and described.

68,398, dated September 3, 1867; reissue 2,820.—Over-Shoe.

—Henry G. Tyer, Andover, Mass.

1 claim a boot or shoe constructed with an elastic gore or gores of valcanizable material, where the said gore is inserted into the sho-before valcanization, and during the process of construction, and the whole completed by the valcanization, substantially as set forth.

NOTE .- FIFTY-SEVEN patents in the above list were solicited through the cientific American Patent Agency.

PENDING APPLICATIONS FOR REISSUES.

pilication has been made to the Commissioner of Patents for the Reissus of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these releases should immediately address MUNN & Co., 37 Park Row, N. Y.

61,250.—MACHINE FOR SCOURING LEATHER.—Jas. Terwilliger, and others, assignees of Ira W. Prey and Edw rd Fitzhewry, Portiand, Oregon. Dated Jan. 15, 1867. Application for reissue receives and siled Sept. 13, 1867.

1st, A nechanism by which by which dually-arranged setts of rubbers or erapers, L., an amohine for flabsuing leather, may alternately be brought into action by the sediprocating motion of a erak, sub-tantially in the manner set forth.

2d. In combination with the crank, N, and ritman, N', we claim the frame, A, rivoted, substantially a manner and for the purpose set forth.

3d, The combination of the hinged arms, H, with or without the arms I, with the spring, **. the parts being constructed and arranged for use, substantially as set forth.

4th, The arring, K, pivoted cross-pieces. K', and levers, O in combination with hinged arms, H i, substantially as set forth an i for the purpose set forth.

orth. In combination with table, G, we claim the roller, E, adjustably sus-ended by the rods, E, and cross bar, P, substantially as and for the purpose

5th, in commission, pended by the rods, E, and cross bar, P, substantially seemed by the rods, E, and cross bar, P, substantially seemed contract to operate, and provided with leather and hide scouring, or insibing, or dressing ato, and provided with leather and hide scouring, or insibing, or dressing as to be capable of being moved in any direction in one plane un ceneath such tool carriage and its tools, the same being to enable any and all parts of the upper surface of a side of leather, when on such table, tablet, or platform, to be readily brought into a position, or into positions, to be acted on by accuring or fulshing tools, while with their carriage they may be in movement, as specified.

William M. Doty, New York

form, to be readily oronant muo a position, or mao position, to be acted on by seconting or finishing tools, while with their carriage they may be in movement, as specified.

3, 483. — WASHING MACHINE.—William M. Doty, New York city. Dated July 13, 1894. Application for reissue received and filed Dec. 18, 1897.

1st, The combination with the corrugated washing board and swinging backets to which it is attached, of a lever or levers, to operate the same under the arrangement, substantially as herein described, so the the sair board may be oscillated horizontally, or back and forth, by a vibratory up and down movement of the levers.

2d, The combination of the oscillating washboard and swinging brackets with a removable hand lever or levers, operating in the manner substantially at the manner substantially and the manner substantially as and for the purposes herein shown and described.

4th, The combination with an oscillatory washboard and stationary wash tub, of a hook and eye, or the mechanical equivalent thereof, for rendering ing the eaid washboard stationary within the tub at the pleasure of the operator.

TT NOTE.—The above claims for Release are now pending before the Pat ent Office and will not be afficially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate appli-cation. MUNN & CO., Solicitors of Patents, 31 Park Row, N. Y.

Advertisements.

The value of the Scientific American as an advertising medium cannot be over-estimated. Its circulation is ten times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. We invite the attention of those who wish to make their business known to the annexed rates. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. If it is worth 25 cents per line to advertise in a paper of three thousand elevalation, it is worth \$2.50 per line to advertise in one of thirty thousand.

RATES OF ADVERTISING.

Back Fage.....\$1.00 a line. Engravings may head advertisements at the

same rats per line, by measurement, as the letter

TO CLEAN STEAM BOILERS—Send

TO Lease and for Sale—A two-story frame building with a head of water. Also, a number of lots. Apply to T. W. LUDLOW, Jr., Yonkers, N. Y.1*

TO PATENTEES.—Metal Small Wares of criptions made for the Trade. Dies and Di ort notice. J. H. WHITE, Newark, N. J.

WOODWORTH PLANERS—IRON Frames 18 to 24 inches wide, \$125 to \$150.

8. C. HILLS, 12 Platt et., New York. PARTNER WANTED—

Active or silent—in a Machine Shop. For particu-rs address MACHINIST, Paterson Postofflos, N. J. 2 2*

FOR SALE—Millstone and Crusher, Wood-apitting Machine, Seroll Saw bench, Shafting, etc. Apply to T. W. LUDLOW, Jr., Yonkers, N. Y.1* FOR SALE CHEAP-

One Stationary Engine, 10x18; one 11x20, all com, including Pump, Heaster, Governor, Fly Wheat (dasting Boils, Exhaust Pipe, etc. Also, one six-hors debased. HUTCHINSON & LAURENCE, Buy six, New York.

WOODWORKING MACHINERY OF superior quality manufactured corner 15th st, and removivaria weaue, Philadelphia, Pa. Special attended the property of the property

Anti-incrustator, H. N. Winans's, 11 Wall st., N. Y. Practical, successful, used 12 years, 2 5*

HYDRAUCLIC PRESSES, STATION-LL ary and Portable for Pressing Powder, Fish, Ol Sooks. Tallow, Linseed, etc. Send for a circular to 2 cowi3" E. LYON, 470 Grand street, New York.

CHINA GRASS JUTE, AND NEW ZEALAND FLAX.—
Reduced fibers, prepared by Stears's Pitent Process, for sale by OLYPHANT & CO., fof China, 2

24

TO VINEGAR MANUFACTURERS.—
The most recent methods of making Vinegar by the slow and quick processes, with and without alcohol, directly from corn and other grains, pottoce, etc. Process to manufacture vinegar and acetic acid by distillation of wood. Address Prof. H. DUSSAUCE, Chemist, New Lebanon, N.Y.

H. WILKINSON & CO.,

Collar Manufacturers, Springfield, Mass., will
farnish, at a small cost above the usual make, Collars
fastened, as shown in the engraving in another column.
Also, couplings, ready to attach, which any harnessmaker
can apply to collars now in use, at a cost, when attached,
not exceeding fifty ceuts each.

PAT. ERASER

Pencil Sharpener, and Pen Holder combined. Sellast sight. Agents wanted. Can make \$30 a week. Sample post paid, 30 cents, or wo styles for 50 cents. Address MORSE ERASSE CO., 241 60 Library st., Philadolphia, Pa.

Important 2 Mechanics WE are prepared to contract and furnish to order Milled Machine Screws of every descrip-tion. A large assortment of the American Machine Screw constantly on hand. TUCKER & APPLETON, 8 Union 8t, Boston, Mass.

VALUABLE

Scientific Books,

For sale by D. VAN NOSTRAND, 192 Broadway, N. Y

HOLTZAPFFEL'S Turning and Mechanical Manipulation. S vols., Svo, cloth.......... BARLOW ON THE STRENGTH OF MA-

Our new Catalogue of Scientific Books, with adenda to Dec. 1, will be sent free on application.

PAINTER'S GUIDE—A Practical Book for Preparing and Mixing Paints, Varnishes, etc., for flouse, Sign, and Ornamental Painting, Carriage Painting and Finishing, in the best style; Gilding, Brouzing, Smaling, Graining Wood and Stone, Transferring Fictures, etc., etc. It tells you how to Paint; it is just what every-body wants to do his own Painting. I will send one of these books on receipt of \$1, free of postage. Address 2 tt B. WEIRICH, Middlebury, Eikhart, Ind.

ABORATORY OF INDUSTRIAL CHEMISTRY.—Prof. H. Dussauce, chemist, is ready to give advices and consultations on all branches of applied chemistry, with plans of factories and drawings of apparatus. Analyses and commercial assays of every kind.

WANTED—AGENTS—\$75 to \$200 per month, everywhere, male and female, to introduce the GENUINE IMPROVED COMMON SENSE FAMILY SEWING MACHINE. This machine will stitch, hem, fell, tuck, quilt, cord, bind, braid, and embroider in a most superior manner. Frice only \$81.5 Fully warranted for 5 years. We will pay \$1,000 for any machine that will sew a stronger, more beautiful, or more clastic sean than ours. It makes the "Elastic Lock Stitch." Every second stitch can be cut, its weak of the companies of t

FOR ENGINE BUILDERS' AND STEAM
Fitters' Brass Work, address
1 10*]

LUNKENHEIMER,
Cincinnati Brass Works.

POWER PUNCHES AND SHEARS; Power Rotary Shears; Power Strain teners; Verti-cal Pulls, etc. Address GREENLEAF & CO., 1 tf

JENNINGS'S REVERSIBLE SPRING Bed Bottom. Simple, Cheap, Efficient, Noiseless, Durable.

"The rich man's spring for comfort, the voor man's for conomy."—Rev. W. M. Richards, Berlin City, Wis.
For Rights, address S. C. JENNINGS, Wantoma, Wis.

WOODWORTH PLANERS A SPE-roved style and workmanship. Wood-working Machine-ty generally. Nos. 24 and 35 Central, corner Union street, Ty generally. Nos. 24 and 26 Cunters, Colors Worcester, Mass.

1°H] WITHERBY, RUGG & RICHARDSON.

500 AGENTS WANTED TO SELL HOWE'S BITTERS WARRANTED TO SELL BALLAGUES, EXCRUDIATED SCIALGE, Terrible Debility, Also, HOWE'S SIRUP—Cures Horrid Cancers, all Blood, Liver, and Skin Diseases. Price \$1 per bottle. Good Agente make \$30 per day, or 100 per cent. For particulars address (C. R. HOWE, Proprietor, Sanaca Falls, N. Y. cas G. B. HOWE, Proprietor, Seneca Falls, N. Y.

STEEL CASTINGS.

HAVING INCREASED OUR FACILIties, we are now prepared to do Job Steel Castings
of all descriptions, to pattern, Address

SCHENECTADY STEEL WORRS,
Behencetady, N. Y.

INVENTORS having Patents to sell will and it to their advantage to visit.

GEO. M. DANFORTH & CO.'S

Inventors' Exchange,

Constant of Nicholas Rotel.

L'IUCTIUUT & L'ACCIUUIU C.

12 Broadway, New York, Opposite 8t, Nicholas Hotel.
Refer by Fermission to John S. Appiston, of Appieton, de Co., Publishers, 445 a.

E. Field, Stockbridge, Mass., Hol. Robt. McClelland, Detroit, Mich., formerly Sec. Int., Washington; Hon. A. B.

Olin, Judge Supreme Court, Washington, D. C. 18

A NEW VOLUME.—AND THE LILUSTER - NEW YORK WITH DOTTAIN STATE OF Kings, NEW VOLUME .- Look out for the Queens, and Emperors; also of Patrick Henry, Edward Everett, F. W. Robertson, and others; including "Signs of Character: Races of Men; Science of the Soul; Social Relations, Love, Courtship, and Marriage; Education and Self-Improvement; Choice of Pursuits, with other matters all ought to know, to be found in no other publication. Only \$3 a year, or 30 cents a number. Address 8. R. Welle, No. 339 Broadway, New York. 1 2

STIMPSON'S SCIENTIFIC WRITING



Materials:—Stimpson's Scientific Gold and Steel Pens and Ink-Retaining Fenholders. Specimen Card of Steel Pens 12 in number, and Holder, mailed on receipt of 20 cents. los lis A. S. BARNES & CO., 111 William st., Ne York

THE

HARRISON BOILER is the only one now offered for sale entirely FREE from DESTRUCTIVE EXPLOSION.

Twenty thousand horse-power have been made and put in operation within the last three years, with a constantly increasing demand. For descriptive circulars and price apply to the Harrison Boiler Works, Philadelphia, Pa., or to J. B. HYDE. Agent, 1 tf] Offices \$ and 10, No. 119 Broadway, N. Y.

Vises! Vises! Vises!

THE UNION VISE CO., of Boston, Mass., make Vises of all kinds for heavy or light work. eir Pipe Vises, with and without extra jaw, are equal the heavlest kin i of piper's work. Send for price list, sale by dealers in hardware.

WANTED—One or two sets good second hand Woolen Machinery. Those having such for sale will address WM. MOOHE, Kokomo, ind. 1 3*

HOISTING APPARATUS FOR MINES, etc., with our Patent Friction Clutches attached with a variety of sizes of Drums and Gearing, manufactured by VOLNEY W. MASON, Providence, B. I.

PARTIES PREPARED TO FURNISH Galvanized Castings, also, Woodkubs for Ice-cream Galvanized Castings, also, Woodtubs for Ice-crea reszers in quantities will please send their address to CHAS. GOOCH, Cincinnati, Ohio.

WANTED—A Second-hand, No.2, Medium Wright's Seroll Saw. Address D. STEVENS, Box 43, Danbury, Conn., Stating price and condition of Machine.

THE AMERICAN TURBINE WATER
WHEEL, Patented by Stout, Mills, and Temple, possions now and valuable improvements, and remedies dedefects which exist in all other Turbine wheels. Per cent of power guaranteed to be equal to any overshot wheel. For descriptive circulars address OLIVER & CO., 3 tf

NAPIER'S

Electro-Metallurgy. FOURTH AMERICAN EDITION.

JUST READY :

CONTENTS:

GON TENTS:

HISTORY OF THE ART OF ELECTRO-METALLUBEY:—Volta's discovery. Chemical decomposition by the pile. First battery. Decomposition of metals upon others. Gilding. Early opinions concerning electro-decomposition. How these results affect the discovery. Disc of observed facts. Spenner's first explication. How these results affect the discovery. Disc of observed facts. Spenner's first explication. How these results affect the discovery. Disc of observed facts. Spenner's first explication. How these results affect the discovery. Disc of observed facts. Spenner's first explication. How these results affect the discovery. Disc of observed facts. Spenner's first explication. How these coating, signature that the discovery of the discovery of the discovery. Historical amounts. Plumbago as a coating, signature. Historical amounts. Plumbago as a coating, signature. Historical amounts. Plumbago as a coating, signature. Historical amounts. Proposed terms. Batterios. Disnatures. Properties of metals fit for battery. Procurations of the plumbago of the discovery. Processes in the plumbago of common acid batteries. Properties of metals fit for batteries. Babington's battery. Woldston's battery, Hunsen's battery. Smee's battery. Earth battery. Bunness's battery. Smee's battery. Earth battery. Bunness's battery. Smee's battery. Earth battery. Bunness's battery. Smee's battery. Earth battery. Proparation of the coin. Ferms of apparatus. Comparative view of exciting solutions. How often solutions should be changed, and glac amalgamated. Making of molds. Preparation of war. to take molds in wax. Kosin with wax. Molds in plaster. Molds in fusible alloy. Molds in gutta-procha. Molds from ferns, seaweed, etc. Mature printing. Casting of replies, etc. Wax molds in wax. Kosin with wax. Molds in plaster. Molds in fusible alloy. Molds in gutta-procha. Molds from ferns, seaweed, etc. Nature printing. Casting of replies, etc. Wax molds in wax. Kosin with wax. Molds in plaster. How the molds. Preparation of plaster. Eact molds in wax

dizing slver. Protection of silvers for mediate Oxiall Provence of the property of the provence of the prove

The above, or any of my Practical and Scientific cooks sent by mail, free of postage, at the publication Books sent by mail, free of postage, at the publication price.

"" My new Catalogue, Oct. 1, 1867, sent free of postage to any one who will favor me with his address.

PORTABLE RAILROAD.—The advant A sges of the Patented Portable Railroad are manifold. Its saves time and money; is particularly adapted for excavating, filling, constructing railroad neds, milidams, levess, etc.; working in mines, quarries, brick vards, and peat bogs. Sold or rented in 36-foot sections; from one to a thousand. Also, Cara entitable for the work to be done, Contracts for excavations, etc., promptly attended to. For particulars or pamphlet, address A. PETELEE & CO., New Brighton, Richmond Co., N. Y.

\$100 IN CASH, Offered to GOOD MEN "Banner of Light,"

And seven other new inventions. \$150 per month, pay sure. Address A. B. CLARKE & CO. Pittsburgh, Pa.

DATENT POWER AND FOOT-PUNCH-ING PRESSES, the best in market, manufactured by N. C. STILES, Middletown, Conn. Curting and Stamp-ing Dies made to order. Seno for Circuiars. 3 ti

BUERK'S WATCHMAN'S TIME DE-TECTOR—important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy manufacturing concerns—capable of controlling with the utmost accuracy manufacturing of the description of a watchman or patrolina, as the same the motion of his beat, it is a concern of the control of

BABCOCK & WILCOX'S PATENT
STATIONABY STEAM ENGINES,
From 25 to 1,000 horse-power, built in the best manner and
at the shortest notice by the
South Brooklyn Steam Engine & Boiler Works
imlay, Summi, and Van Brunt sta, Brooklyn, N. Y
EF Over 4,900 horse-power of these engines are now
running and contracted for.

2 tf
D. McLEOD, Proprietor.

500 More Ag'ts Wanted to sell Richmond gists. For Sample Bottle, inclose 160... or ci cular, Sc. stamp. Address Richmond & Hoster, science 7 sale, 3, 2, 3.

PRICE LIST OF

STIPS' FILES, PLYERS, CUTting Nippers, Hand Vises, Steel
Wire, etc.; Twist Drills and Chucks: Drawing Instruments, Steel Letters and Figures sent to any address.

GOODNOW & WIGHTMAN,

16

PENEDICT'S TIME," for this Month trom New York, with City Map, 25c., sent by mail.

BENEDICT BROS., Jowelson, 171 Broadway, BENEDICT BROS., Jovelson, 181 Broadway, BENEDICT BROS., Brooklyn, 284 Fulson st. 1 tf.

UNION PACIFIC RAILROAD CO.

NOTICE.

THE COUPONS OF THE FIRST MORTGAGE BONDS

Union Pacific R. R. Co.,

DUE JAN. 1st., 1868. Will be Paid on and after that Date, IN GOLD COIN,

FREE OF GOVERNMENT TAX, At the Company's Office, No. 20 Nassau street, New York.

1 2 JOHN J. C18CO, Treasurer.

RADLEY'S GAMES.—
Instead of spending your money for Toys that amuse forts day, buy your children Games that are slways new.

Buy any of BHADLEY'S GAMES,
And you will be sure o something interesting and
GENERALLY INSTRUCTIVE.
All dealers have them. Send stamp for Catalogue to
MILTON BRADLEY & CO., Publishers,
1 Springfeld, Mass.

GIVEN TO ANY ONE WHO Detect. The best, simplest, lightest, and most convenient Safeguard against Pickpockets in existance. Attached to any cost or vist in two minutes, weight 5% os. the change of the convenient safeguard against Pickpockets in existance. Attached to any cost or vist in two minutes, weight 5% os. the change of the Picket of the change of the Picket of the change of the Picket of the Convenient Conve

New, Important Books FOR PRACTICAL MEN.

PARKS AND PLEASURE GROUNDS; A MANUAL OF DYEING RECIPES For general use. By James Napler, F.C.S., with numerous patterns of dyed cloth and silk. . 12mo. \$5 75

PRACTICE OF PHOTOGRAPHY. By Robert Hunt, F.R.S., Vice-president of the Photogra-phic Society of London. With numerous illustrations, 12mo.

THE PRACTICE OF HAND-TURNING THE TRACE ACCES in Word, Stell, etc., with Instructions for turning such works in metal as may be required in the practice of turning in wood, tworg, etc., and an appendix on ornamental turning, By Francis Campin. Illustrated.

The above, or any of my books sent by mail free of ostage, at the publication price. gr My new Catalogue of October 1, 1867, sent free of postage to any one Pavoring me wild bis address.

HENNY CAREY BAIRD.

1 S]

406 Walmit street, Philadelphia.

WANTED, an Agent—One chance in each nown, worthy the attention of an active business man, to take the agency for the sale of Bradsterest's Rubber Molding and Weather Strips, applied to the sides, bottom, top, and center of doors and windows. The sale is beyond anything ever offered before to an agent, and from \$10 to \$50 per day can be made. Send for agent's circular. The first who apply secure 3 bergain. Terms for Molding, cash. J. R. SHADSTHEES & CO., Boston, Mass. 1 3

TURBINE WATER WHEELS.nfactured and for sale by the NOVELTY IRON WORKE Foot of East 12th st., N. Y. Send for Circular. 1 12°

SHEET AND ROLL BRASS,
BRASS AND COPPER WIRE, GERMAN SILVER, BY
MANUFACTURING CO.,
Thomaston, Conn. Thomaston, Conn.

Special attention to particular sises and widths for Type
Founders, Machinists, etc.

\$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springaeld, Vt.

A. BAGLEY & CO., Manufacture
Round and Square Head Set and Cap Server turne
to the har, and of extra quality, and case-harden
and used in the construction of all kinds of matorders solicited. Send for price list and exE. A. BAGLEY & CO.,
Woroster, Mass.

OIL! OIL! OIL!!! FIRST PREMIUM......PARIS, 1867.

EXPOSITION UNIVERSELLE! PEASE'S IMPROVED OILS! Acknowledged the Best in the World! The Highest

Grand Silver Medal and Diploma! The Only One to the United States awarded to

F. S. PEASE,
For the Greatest Excellence in Oils for Lubricating and
Burning.

WORLD'S FAIR—TWO PRIZE MEDALS
Awarded to F. S. PEASE for Improved Engine, Surabi, Lard, and Premium Petroleum, as the Best made?

These Improved Oils cost no more than many of a common oils in market, while they are enforced by a greatest experience and highest authority in the Usit States and Europe, and offered to the public upon most thorough, reliable, and practical less as the BOIs made for Railroads, Steamers, and for Machinery and

Burning.

F. S. PRASE, Oil Manufacturer,
Nbs. 61 and 68 Main street, Buffalo, N. Y.
N B.—Reliable orders filled for any part of the world.

LE COUNT'S PATENT
HOLLOW LATHE DOGS, MACHINIST
AND BOLLER MAKERS' CLAMPS.
Are as Strong as Steel, Light and Nest. At a Low Price.
Send for Circumstructure.
C, W. LECUUNT.
South Norwalk, Cons.

AMERICAN EMERY.

A RROWSIC EMERY, Manufactured at Bath, Me. 411 numbers from four up to one hundred and twenty. The only real mine in the world, excepting For sale in quantities to suit, at reduced STANWOOD, McLELLAN & FULLER 24 Central street, Bosto

From Stanly Rule and Level Co., New Britain, Conn
"We have been using some numbers of your Emei
steel, and it gives good satisfaction. If it proves to
as on trial, thus far, we shall use nothing clice. For
reason, London emery does not give us good satisfactor
on steel.

ristol, Conn.: Our men, who work by the job, say your Emery is bet r than any English or American Emery they ever used

Mackintosh Hemphill Co., Pittsburgh, Pa.: The quality of your Emery Cloth is excellent.

ATHE CHUCKS—HORTON'S PAT.

ENT-from 4 to 55 inches. Also for car wheels,
handhoturer's addres, E. HORTON & BON, Windson

1 87

THE BEST BOLT CUTTER IS MERRI MAN'S PATENT—Which cuts a fell, smooth threas once passing over the bolt. The dies revolve, are in standy adjustable to the slightest variation, and open to release the bolt. Foreign Patents for cale. Send for circulars.

1. B. BROWN & CO., 12

PORTABLE STEAM ENGINES, COM-bining the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descrip-tive circulars sent on application. A ldress J. C. HOADLEY & CO., Lawrence, Mass.

Chines, Molding, Mortising, Tenoning, and Sash Machines, Seroll Saws, Re-Siliting Mills, Epoke Lathes, Daniels's, and Gray & Wood Planers, Shafting Palleys, etc., at reduced prices, Address 125 North 3d st., Philadelphia, Pa.

BROWN'S PATENT LOW-WATER RE-Steam Boliefs by reason of low water. Warranted the most reliable and most simple low-water indicator ever offered. Sole Agents for New York State, 111] M. T. DAVIDSON & CO.,

CHLENKER'S PATENT BOLT CUT-ting Machine.—The Best in Market.—Two Sizes, cut-ting boils from % to 5 inches. Up to 2% inches, once pass-ing over the from sufficient for cutting a perfect thread, elements of the control of the control of the cutting and perfect properties of the control of the control of the control of the order. Also, nut taps formished to order. Send for cir-circular. Address R. L. HOWARD, Buffalo, N. Y. 16*

WHEATON'S OINTMENT cures the Itch
WHEATON'S OINTMENT will cure Salt Rheum.
WHEATON'S OINTMENT ourse Sold Sores.
WHEATON'S OINTMENT ourse salt diseases of the Skin.
PUR sall 90 cents. All Druggists sell it.
WEEKS & POTER, Boston, Proprietors.
2 ff

WIRE ROPE.

JOHN A. ROEBLING
Trenton, N.J.

FOR Inclined Planes, Standing Ship Rigand Cranes, Tiller Ropes, Saah Cords of Copper and Iron,
Lightning Conductors of Copper. Special attention given
to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 1 of the

WROUGHT-Iron Pipe for Steam Gas and Water; Brass Globe Vaives and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 30 John st., N. Y. 1 ?*

De BALLAUF, MODEL MAKER, No.
Orders for Certified Duplicases of Patent Office Models
and Original Models for Inventors.
I 5°

\$200 A MONTH IS BEING MADE by Ladies and Gentlemen. Send ior our five Catalogue containing Samples and Prices. Address 114-E. 2 & M. SPENOER & CO., Brattleboro, Vt.

BOILER FELTING SAVES TWENTY
JOHN ASHCROFT,
50 John st., New York.

CTEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies.

7°] JOHN ASHCROFT, 50 John st., New York.

B. T. TRIMMER'S Smut Machines and Separators, manufactured at the Rochester Agricultural Works, Rochester, N. Y.

TAYLOR'S GROOVING MACHINES— Groove with and across the grain, % to 1% inci-wide. Sold only by S. C. HILLS, 12 Platt st., N. Y. 1 6

A LLEN'S PATENT Anti-Lamina for pre-ers, can be used at any time while the Enrine is working for particulars address ALLEN & NEEDLES, 1 5]

CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. % Pine street, New York. Assays and Analyses of all kinds, Advice, Instruction, reports, etc., on the neefin arts.

FOR BRASS LATHES and all Machiner Improved Lathes for making large valves, etc. Adures Exeter Machine Works, Exeter, N. H.

MASON'S PATENT FRICTION
CLUTCHES, for starting Machinery, especially
Beary Machinery, without sudden shock or jar, are man
ulactured by
VOLNEY W. MAON,
Providence, R. J.

SEND FOR A DESCRIPTIVE CATA-

Shaw & Justice's DEAD STROKE POWER HAMMER,
Manufactured and for sale by PHILIP & JUSTICE.
42 Cliff st., New York, or 14 North 5th st. Philadelphia

LUCIUS W. POND,

Iron and Wood Tools, And Machinery,

TURBINE WATER WHEELS.

Works at Worcester, Mass.

Sale Rooms 85 Liberty et., (2 doors West or Broadway), New York.

DOUGLASS' PATENT SELF-FEED Friction Hard Drill. The simplest and best in use. Send for illustrated Circular.

13 HUTCHINSON & LAURENCE, 8 Dey st.

PLANER AND MATCHER for \$350, a good, new machine. S. C. HILLS, 12 Plats st. N. Y.

PRATT, WHITNEY & CO.,
HARTFORD, CONN
Make Hand and Engine Lattice, Crank and Gear Plan
ers, Drille, Screw and Milliam Machines, Water Motors
wic., unsurpassed for nice construction, strongth, dura
blitty, and convenience.

THE FUEL SAVING FURNACE CO., No. 205 BROADWAY N. Y.

EMPLOYMENT! \$16 a day and Expenses

ENOIR GAS ENGINES, From half-Horse to three Horse-power, for saic at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21°

TODD & RAFFERTY, Manufacturers and Works, Pateroon, N. J.; Warerooms, & Doy st., New York. Steam Engines and Bollers, Steam Framps, Machinists Tools, Also, Flax, Hemp, Yow, and Rope Machinery; Snow's and Judson's Governore, Second-hand Machinery; Snow's and Judson's Governore, Second-hand Machinery;

BABCOCK & WILCOX'S
ATENT STATIONARY STEAM ENGINES, Built by the
Hope Iron Works, Providence, R. I.
arranted Spperior to any other engine in the market.

ited Superior to any other engine in the marks my of fael, regularity of speed, and non-liabili-tement. [2 tf] JOS. P. MAN ON, Agt.

PRICESON CALORIO ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these cargines in ane, have demonstrated beyond cavil their superiors in the case than ten horse-power is required. Provent in the case than ten horse-power is required. Provent in the case than ten horse-power is required. Provent in the case of the case

O IRON FOUNDERS .-By using the waste heat from a Cupola Furnace, onnected with a Harrison Boller, a saving of the entire out of fuel for the blast can be sustanteed.

As thus applied, it, may be seen daily in operation from to 5 o'clock, p. m., at the Harrison Boller works, Gray's erry Road, Fhiladelphia Pa. J. B. HYDR, Agent. 1 if

BARREL MACHINERY. — Greenwood's Patent Stave and Heading Machinery, for Tight and Work. Geddie's Patent Harrel Heaters. 6. L. Ben-Patent Convex Emery Wheels, for Gamming and John GEENWOOD. Start Barrel Machine Works Mochester, N. 7. 1 11*67

WANTED-Ladies and Gentlemen everyhere, ha business that wil pay §5 to \$20 per book, patent right, or modical humbug, but a article of merit, wanted by everybody, and sold ird the usual price, with 200 per cent profit to our samples and circulars sent by mail for \$5 cents. WHITNEY & SON, 6 Tremont st., Boston, Mass.

THE Excelsior Wind Mill and the Genuine Concord Axles manufactured by 15°] D. ARTHUR BROWN & CO., Fisherville, N.H.

RAILROAD, STEAMSHIP, MANUFAC-turers, and Engineer's supplies, of all kinds, at M. T. DAVIDSON & CO.'S, 34 John st., N. Y

L E COUNT'S Patent Hollow Lathe Dogs,

S TEAM and GAS FITTERS, Also, Plumber's Goods, and Tools of all kinds. Qulmi's Patent Soller Ferrule, the oaly Sure Remedy for a leaky Tube. Also, Steam Gages, Gage Cocks, Water Gages, safety Valvee and Fee 1 Pumps, for sale oy JOHN F. C. RIDER, 47 Devst. N. Y. Manufactory at South Newwarket, N. H. 25-12

WANTED-Active Partner with Cash Capital—Ten Thousand Dollars—to engage in the manufacture and sale, in the Middle, Western, and Southern States, of the best Brick Machine in use. It makes three kinds of brick, viz: Common, Stock, and Pressed, was awarded dirst premium N. N. State Fair, 1987, for best front bricks. For further particulars address 24 Scow] J. A. LAFLER, Alblon, Orleans Co., N. Y.

BODINE'S JONVAL TURBINE WATER



turers of the above when are prepared to farmish and warrant like same to give more power than any overshot or other turbine when all the made unity the amount of water. These wheels have been teated with all the wheels of note in the courty, and have never failed to

will take them out at our own expense. The attention millwrights is invited to this wheel. Agents wanted every county in the United States and Canadas. Send it descriptive circular.

J. R. BODINE & CO., Month Mortls, New York.

PLATINUM—For all Laboratory and Man-utacturing purposes. Platinum Scrap and Ore Pur-chased. H. M. RAYNOE, Office 766 B'dway, N. Y. S 10° co



ATENTS

The First Inquiry that presents used to one who has made any improvement or discovery is: "Can I obtain a Patent?" A possible answer can only be had by presenting the present of a Model, Drawings it full Specification. Various official its must also be observed. The or to do all this business himself are needs. After a season of great perior in patent business, and have all one production of the patent business and have all one was a full of the patent business and have all one was the properties.

sy and delay, to me a september of the control of t

rights.

Mesers, MUNN & CO., in connection with the publication of the Scientific American, have been actively engaged in the tundness of obtaining patents for over twenty vare-nearly a quarter of a century. Over Fifty thou ands inventors have had benefit from our connects. More han one third of all patents granted are obtained by this firm.

han one tairs of an patenn grasses are overselved.

Those who have made inventions and desire to consult with us, are cordisily invited to do so. We shall be happy to see them in person, at our office, or to advise them by letter. In all cases they may expect from us an honest opission. For such consultations, opinion, and advice, to make no charge. A pon-and-link select, and a description of the invention should be sent, together with stamps for resturn postage. Write plainly, do not use pencil nor pale link; he brief.

All business committed to our care, and all consultations.

ink; be brief.

All business committed to our care, and all consultations, are kept by as secret and strictly confidential. Address MUNN & CO., 57 Park Row, New York.

cress MUNN & CO., 37 Fark Row, New York.

Preliminary Examination.—In order to obtain a Preliminary Examination, make out a written description of the invention in your own words, and a rough beneil or pen-and-ink sketch. Send these with the fee of \$5 by mall, addressed to MUNN & CO., 37 Park Row, and in time time you will receive an acknowledgment thereof, followed by a written report in regard to the patentable of the control of the patentable of the control of a special search, which we make with great earc, among the models and patents at Washington to ascertain whether the improvement presented is patentable.

able.

In Order to Apply for a Patent, the law requires that a model shall be furnished, not over a foot in any mensions,—mailler, if possible. Sead the model by express, pre-pand, addressed to Mann & Co., 37 Park Row, N. T., together with a description of its operation and merits on coedly thereof we will examine the invention careful of the patentability, free of charge, and the patentability, free of charge.

when with a description of its operators in the control of the coefficient and advise the party as to its patentability, free of charge.

The model should be nestly made of any suitable materials, strongly fastened, without gine, and nestly painted. The name of the inventor should be engraved or painted on the inventor should be engraved or painted upon it. When the invention consists of an improvement upon some other machine, a full working model of the whole machine will not be necessary. But the model must be sufficiently perfect to show, with clearness, the hew medienes or medical compounds, and useful mixingers of all kinds, are patentable.

When the invention consists of a medicine or competud, or a new article of manufacture, or a new composition, samples of the article must be turnished, neatly put up. Also, send us a full statement of the ingredient, proportions mode of preparation, uses, and merits.

Releasures.—A ressure is granted to the original patentee, his heirs, or the assignees of the entire interest, when by reason of an insufficient or detective specification the original application. As a support of the party of parts of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by paying the requirements of the law, as in original application, by the paying the requirements of the law, as in orig

& CO., 27 Park Row, for full particulars.

Interferences... When each of two or more persons elaims to be the first inventor of the same thing, an "increment" is decisred between them, and strail is had before the Commissioner. Nor does the fact that one of the particle has already obtained a beaten prevent such an instence occ; for, although the Commissioner has no power to exence a parent sixedy issued, he may if he finds that another person was the prior inventor, give him also a patent, and thus place the sum on an equal recting before the courts and the public

Guriel: Applications. When, from any reason, are desirous of applying fur Patents or Caveats, in war marry, without a moment's less of time, they have by to write or telegraph us specially to that effect, do we will make special exertions for them. We can repaire and mail the necessary papers at less than an early notice, if required.

prepare and mail the measury papers at less than an hour's notice, if required.

Forreign Patents.—American inventors should bear in wind that, as a general rule, any invention that is valuable to the patentse in this country is worth equality as as much in England and some other foreign centries. Five Patents.—American, English, French, Belgian, and Prussian—will sector an inventor exclusive monopoly to his discovery samont own surpless of any inventor in the section of the sectio

MUNN & CO., No. 37 Park Row, New \ ork City.

Patents are Granted for Seventeen Years, as following being a schedule of fees:

a filing each Cavest

m filing each application for a Patent, except fo. a design. On assuing each original Patent.
On appeal to Commissioner of Patents.
On spplication for Reissue.
On coplication for Extension of Patent.
On granting the Extension.
On filing a Disclaimer.
On fling application for Design (three and a half

cars) lling application for Design (seven years). lling application for Design (fourteen years addition to which there are some small revi s. Residents at Canada and Nova Ecotia p

PATENT CLAIMS.—Persons desiring the claim of any invention, patented within tairty years, can obtain a copy by addressing as note to this office, giving name of patentee and date of patent, when known, and inclosing \$1 as a fee for copying. We can also furnish a sizeich of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO. tent Sciletors, No. 37 P Bow, New York.

Advertisements.

A limited number of advertisements will be admitted in this page at the rate of \$1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

Architectural Details. 714 Designs to Scale, by Cummings, post paid..........\$1

Modern Architecture. Plans and Elevations, by Cummings, post paid.......\$1

Practical Stairbuilder. tairs and Rails. 30 plates. Post paid..

Church Architecture.

GEO. E. WOODWARD, Publisher, 191 Broadway, New York. All Books on Architecture. Send for Catalogue. los

Superior Tools for Sale. Planer, 616 ft. by 2 ft. by 2 ft.

a 3 4 16 inches, by 16 inches. Engine Lathe, 18-in. swing, turns 5 ft., with cross feed. do. 18 4 6 4 and taper. do. 20 6 6 0 or without 20 " " 6 " " or without cross feed.
24 " " 10" "cross feed and taper. PRATT, WHITNEY & CO.,
Manufacturers of Machinist and Gun Tools,
Hartford, Conn.

J. BOLLINGER, Glen Rock, Pa., Practical Millwright Draftsman, Hydraulic Engineer, achinery Agent. Twenty Years' Experience. 30sts



WOODWARD'S SUB urban and and Country New Designs, \$1 50 post p Geo. E. Woodward,

ARCHITECT,
191 BROADWAY, New YORK.
Send stamp for Catalogue of all
new books on Architecture,
2 tf os

TURBINE WATER WHEELS.



1 4°tt]

RETNOLDS PATENT embodies the progressive spirit of the age. Simplicity, Economy, Durabili ty, Accessibility all combined. The only Turbine that excels Overahots. Awarded the Gold Medal by American Institute. Singuished for all kinds of Mills, made on Mechanical Frincipies, under my personal supervision, having had long experience. Circulars sent free.

GEORGE TALLCOT, No. 96 LIBERTY STREET, NEW YORK.

REPEATING Vest Pocket Light, in ele-gent Silvered Cases. Send for circular. Address L. F. STANDISH, Springfield, Mass.

BEFORE BUYING TURBINE WATER WHEELS—Send for Circulars of PREESKILL MANUFACTURING CO., Peckskill, N. Y. 1 508*]

PHOENIX IRON WORKS

Established 1834.

GEO. S. LINCOLN & CO.,

Iron Founders and Manufacturers of Machinists' Tools

4 to 60 Arch street, Harr, ord, Conn.

We are prepared to furnish first-class Machinists' Tools
on short notice. Samples may be seen in our Wareroom.
Also, we keep constantly on hand our Patent FRICTION
PULLEY, Counter Shafts for Lathes, etc.

24 tf

PORTABLE AND STATIONARY Steam
Regimes and Boilers, Circular Saw Mills, Mill Work
Lotton Girs and Cotton Gin Materials, manufacture
by the ALBERTSON & DOUGLASS MACHINE CO.
Rew London, Conn.

STEAM ENGINES and BOILERS, Steam Prints, Engine Lates, Planers, Shaping Machines, Brass Finisher's Tools, and Machines' Tools of all kinds. Also, Griss Mills, Octoor Gins, Saw Mills, Whee and Machines, Shingle Machines, and Machines, Shingle Machines, and Machines, Ching F. C. RIDER'S, of all kinds at JOHN F. C. RIDER'S, Wannfactory at South Newmarket, N. H. I 16

PATENT SHINGLE, STAVE, AND
Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and
Heading Jointers, Heading Rondoers and Planers, Equalisting and Cut-off Saws. Send for Illustrated List,
FULLER & FORD,
14*t(] 289 and 284 Madison street, Chicago, III

SAWS. SAWS. SAWS.

Attention, Lumbermen!

HENRY DISSTON, OF PHILADELPHIA,

IS MAKING BOTH INSERTED AND SOLID-TEETH SAWS THAT ARE PRE-FERRED, BY THOSE WHO USE THEM, ABOVE ALL OTHERS.

For Particulars send to Factory, 67 and 69 Laurel street, Philadelphia, Pa. [25 130s]

Iron Bridge Builders A SHCROFT'S LOW WATER DETECT-A RE HEREWITH INVITED TO OF. ASHCROFT, 50 John st., New York. A RE HEREWITH INVITED TO OF-terus for an IECC Propo als, of the most

ARE HEREWITH INVITED TO CARfer Plans and Propo als, of the most approved patterns for an IRGN DRAW BRIDGE of 180 feet in length,
across the Milwankee River, at the foot of Huron st., in
the City of Milwankee, and all parties who are desirous
to make such ofter are hereby notified that the undersigned will receive such plans and proposals at his Office
until the 8th day of January, on which day the same will
be submitted to the Joint Committee on Bridges for their
opinion
FREDBICK WILMANNS.

Controller City of Milwankee.

ENGINE LATHES, A Specialty, from new patterns of superior style and workmanship. Machinist's Tools generally. Cor. 16th st. and Fennsylvania Are., Phila., Pa. Hafitington & Haskins. 113

FOR THE BEST FRICTION CLUTCH PULLEY, apply to HUTCHINSON & LAURENCE, 8 Dey street, new York.

SMALL STEAM ENGINES, From 2 1-2 to 8 Horse-Power, manufactured and in store. For sale by JOHN F. C. RIDER, South Newmarket, N. H., or 47 Dey st., New York. 1 16

PECK'S PATENT DROP PRESS,

All Sizes, on hand or made to order at short notic
by the patentees and sole manufacturers.

MILO PECK & CO.,

1 3

291 Elm st., New Haven, Coun.

CIRCULAR SAWS,



WITH

EMERSON'S PATENT MOVABLE TEETH.

These Saws are meeting with

UNPRECEDENTED SUCCESS,

GREAT SUPERIORITY OVER EVERY OTHER KIND, Both as to

EFFICIENCY AND ECONOMY

Is now fully established.

Also, EMERSON'S PATENT PERFORATED CROSS CUTTING, CIRCULAR, AND LONG SAWS.
(All Gumming Avoided.) And

EMERSON'S PATENT ADJUSTABLE SWAGE, For Spreading, Sharpening, and Shaping the Teeth of all Splitting Saws. Price \$5.

AMERICAN SAW COMPANY,
Office No. 2 Jacob street, near Ferry street, New York.

1
Send for New Descriptive Pamphlet and Price List.

MILLSTONE-DRESSING DIAMONDS,
Bet in Patent Protector and Guide. Sold by JOHN
DICKINSON, Patentee and Sole Manufacturer, and Importer of Diamonds for all mechanical purposes; also,
Manufacturer of GLAZIERS' DIAMONDS, No. 64 Nassau street, New York city. Old diamonds reset. N. B.—
Send postage stamp for descriptive circular of the
Dresser.

WHEELER & WILSON, 625 BROAD-onhole do.

CAUTION.

We are the Sole Agents, in New York and its vividinity, for the Silver Lake Manufacturing Co.'s Patent Lubriceting Packing for Steam Engines, Pumps, etc. All parties are cautioned against the use or sale of any packing made from dry soon stone or other powdered substances used in any fibrons material.

M. T. DAVIDSON & CO.

111]

ENGINE LATHES, IRON PLANERS, Upright Drills, Bolt Cutters, Compound Planers. Upright Drills, Bolt Cutters, Compound Planers, Stotters, Shapers, Gear-Cutting Engines, Universal Chucks Twist Drills, Batchet Drills, etc., at reduced prices. Ad-dress. CHAS, H. SMITI. 135 North 3d sc., Philadelphia, Pa.

Sault's Patent FRICTIONLESS Locomotive Valves, easily applied; requires no changes.
M. & T. SAULT. New Haven, Coun.

NITRO-GLYCERIN.—

NITRO-GLYCERIN.—

UNITED STATES BLASTING OIL CO.—We are now prepared to fill all orders for Nitro-Glycerin, and respectfully invite the attention of Contractors, Miners and Quarrymen to the immense economy in the use of the same. Address orders to MES DEVEAU, Sec.,

SI Pine street, New York

PRESSURE BLOWERS—Equal in Force to Piston Blowers, and a perfect substitute for both Fan and Pistons—running more easily than either. Adapted for Blast, and Cupola, and Heating Furposes, Forges Steamships, Bollers, Ventilation, etc., etc. Prices according to sizes, ranging from \$3.0 st. Prices according to sizes, ranging from \$3.0 st. Prices according to sizes, ranging from \$3.0 st. Prices according to \$3.0 st. Prices acc

RON PLANERS, ENGINE LATHES, ity, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven, Ct.

S TOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York.

FOOTE'S PATENT.—The First and Only LOOTE'S PATENT.—The First and Only Invention for Threading and Setting the Sewing-Machine Needle, which enables all, especially those whose eyes have suffered from working on black clothes and threads of the same color, to thread and set the needle with the greatest case and rapidity. We having just completed an arrangement with M. B. Foote, which makes us the Sole Agents of the United States, are prepared to fill all orders. Agents of Sewing Machines will find it to their advantage to secure the agency for their territory, as we make a liberal discount to them and the trade. The thresder and setter combined, sent prepaid to any address upon the receipt of all.

MUMFORD & CO., Agents, 12°

70 Asylum st., Hartford, Conn.

MESSIEURS LES INVENTEURS-A RESSIGUES LES INVENTED TO LEST AVENTED AND SUPPORT A

munn & CO., ntific American Office, No. 37 Park Row, New York

1868.

Scientific American.

BEST PAPER IN THE WORLD.

Published for Nearly

A QUARTER OF A CENTURY.

This Splendid Newspaper, greatly enlarged and improved, is one of the most reliable, useful, and inter-cating journals ever published. Every number is beau-tifully printed and elegantly illustrated with several Original Eugravings, representing New In-ventions, Novelties in Mechanics, Agriculture, Chemis try, Photography, Manufactures, Engineering, Science

Farmers, Mechanics, Inventors, Engineers, Chemists, Manufacturers, people in every profession of life, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the value of which is beyond pecuniary estimate. All patents granted, with the claims, published weekly. Every Public or Private University and the Control of t Every Public or Private library should have the work cound and preserved for reference.

Dound and preserved for reference.

The yearly numbers of the SCIENTIFIC AMERICAN make a splendid volume of nearly one thousand quarto pages, equivalent to nearly four thousand ordinary book pages. A New Volume commences January 1, 1868. Published Weekly. Terms: One Year, 83; Haif-Year, 8150; Clubs of Ten Copies for One Year, 825; Specimen Copies sent gratis.

Address

37 Park Row, New York.

The Publishers of the Scientific American, The Publishers of the Sectional and Apper, have acted as Solleitors of Patents for twenty-two years. Thirty Thousand Applications for Patents have been made through their Agency. More than One Hundred Thousand Inventors have sought the counsel of the Proprietors of the SCIENTIFIC AMERICAN concerning their inventions. Consulta-tions and advice to inventors, by mail, free. Pamphlets concerning Patent Laws of all Countries, free.

EFA Handsome Bound Volume, containing 150 Mechanical Engravings, and the United States Consus by Countles, with Hints and Receipts for Mechanics, mailed on receipt of 25c.